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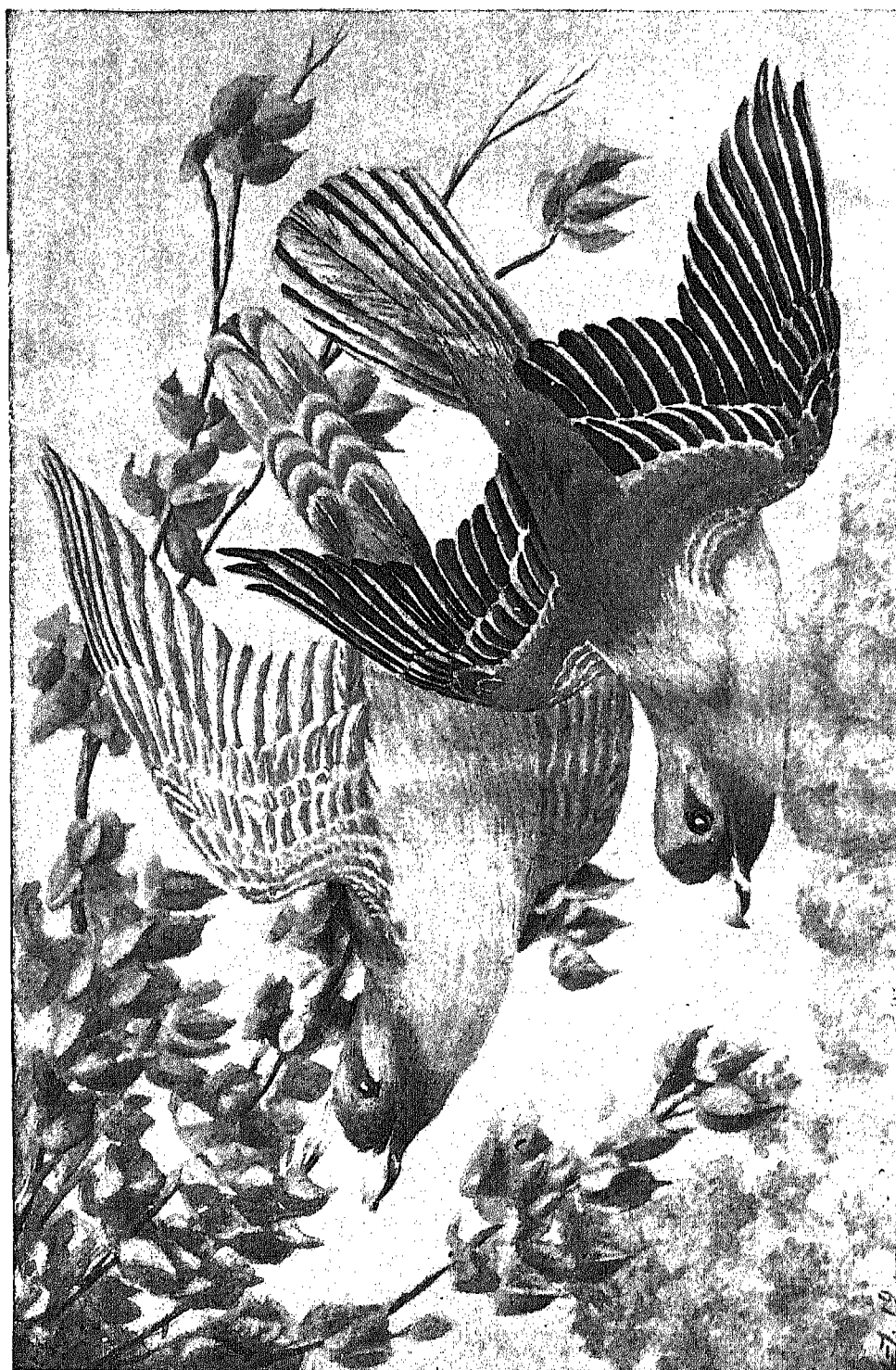
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INDIAN AGRICULTURAL
RESEARCH INSTITUTE, NEW DELHI

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GREEN PIGEON.

THE
COMMON BIRDS
OF
INDIA

DESCRIBED BY
DOUGLAS DEWAR
AND
ILLUSTRATED BY
G. A. LEVETT-YEATS

VOLUME TWO
NON-SPORTING BIRDS
NON-PASSERINE WATER AND LAND BIRDS

8959

CALCUTTA AND SIMLA
THACKER, SPINK & CO

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PUBLISHER'S FOREWORD.

When the first volume of this series made its appearance Mr. Dewar mentioned in his preface that if the book was well received, further volumes would be issued. In the event this attempt to produce a popular illustrated account of some of the feathered denizens of India has proved exceedingly popular and the publication of the present volume is the result.

Thanks are tendered to the *Times of India Illustrated Weekly* for permission to reproduce the coloured frontispiece. Portions of this volume appeared in the *Empress* and the *I. P. M.* of Allahabad, respectively, and acknowledgments are made for permission to reprint the articles and use the illustrations.

THACKER, SPINK & CO.

LIST OF ILLUSTRATIONS.

	PAGE
Green Pigeon (Coloured)	<i>Frontispiece</i>
Head and Foot of Coot	2
Great-crested Grebe	3
Head and Foot of Grebe	4
Head and Foot of Dabchick	5
Head of River-Tern	6
Skimmers	8
Young Skimmer	9
Head and Foot of Herring-Gull	10
Pelicans and Cormorants	11
Head of Cormorant	12
Wing of Pheasant-tailed Jacana	15
Head and Foot of Jacana	16
Feathers of Jacana	17
Bronze-winged Jacana	18
Head and Foot of Moorhen	19
Head and Foot of Purple Moorhen	21
Purple Moorhen and Coot	22
White-breasted Water-Hen	24
Young Spur-winged Plover and Red-wattled Lapwings and Storm-Curlew ..	25
Head of Lapwing	26
Spur-winged Plover	27
Head and Foot of the Stone-Curlew	29
Head and Foot of Pratincole	30
Head and Foot of Stilt	32
Head and Foot of Sandpiper	33
Head and Foot of Redshank	33
Head and Foot of Spotted Redshank	34
Head of Whimbrel	35
Head and Foot of Curlew	36
Curlew	37
Head and Foot of Bar-tailed Godwit	38
Black-billed Godwit	39
Sarus	41
Head and Foot of Crane	44
The Demoiselle Crane	45
Head and Section of Bill of Flamingo	47
The Painted Stork	51

LIST OF ILLUSTRATIONS.

vii

	PAGE
Head and Foot of King Curlew	53
Night Heron	55
Adjutant Storks, Herons and White Ibis	56
Head and Foot of Heron	58
Golden-backed Woodpecker	63
Western-Himalayan Pied Woodpecker	64
Malabar Great Black Woodpecker and Himalayan Pigmy Woodpecker	67
Scaly-bellied Green Woodpecker (Male)	69
Long-tailed Broadbill	72
Small Green Barbet and Coppersmith	74
Indian Green Barbet	76
Great Himalayan Barbet	77
Indian Roller	80
Blue-tailed Bee-eater	83
Chestnut-beaded Bee-eater and Common Bee-eater	85
Blue-bearded Bee-eater	86
Common Kingfisher	89
Indian Pied Kingfisher	91
White-breasted Kingfisher	93
White-collared Kingfisher and Stork-billed Kingfisher	95
Indian Crested Swift	101
Palm Swift and Brown-necked Spine-tail	104
Young Great Hornbills and Indo-Burmese Pied Hornbill	110
Indo-Burmese Pied Hornbills	110
Great Hornbill	112
Malabar Trogons (Female)	123
Malabar Trogons (Male)	124

NOTE.

In addition to the drawings of Mr. Levett-Yeats this volume contains 24 illustrations reproduced from Le Messurier's *Game, Shore and Water Birds of India*. These pictures consist of life-size pictures of heads, feet and feathers and should assist materially the identification of birds as they convey an idea of size which cannot be obtained from an illustration depicting birds in their natural surroundings as Mr. Levett-Yeats does.

THE COMMON BIRDS OF INDIA

THE NON-SPORTING SWIMMING BIRDS.

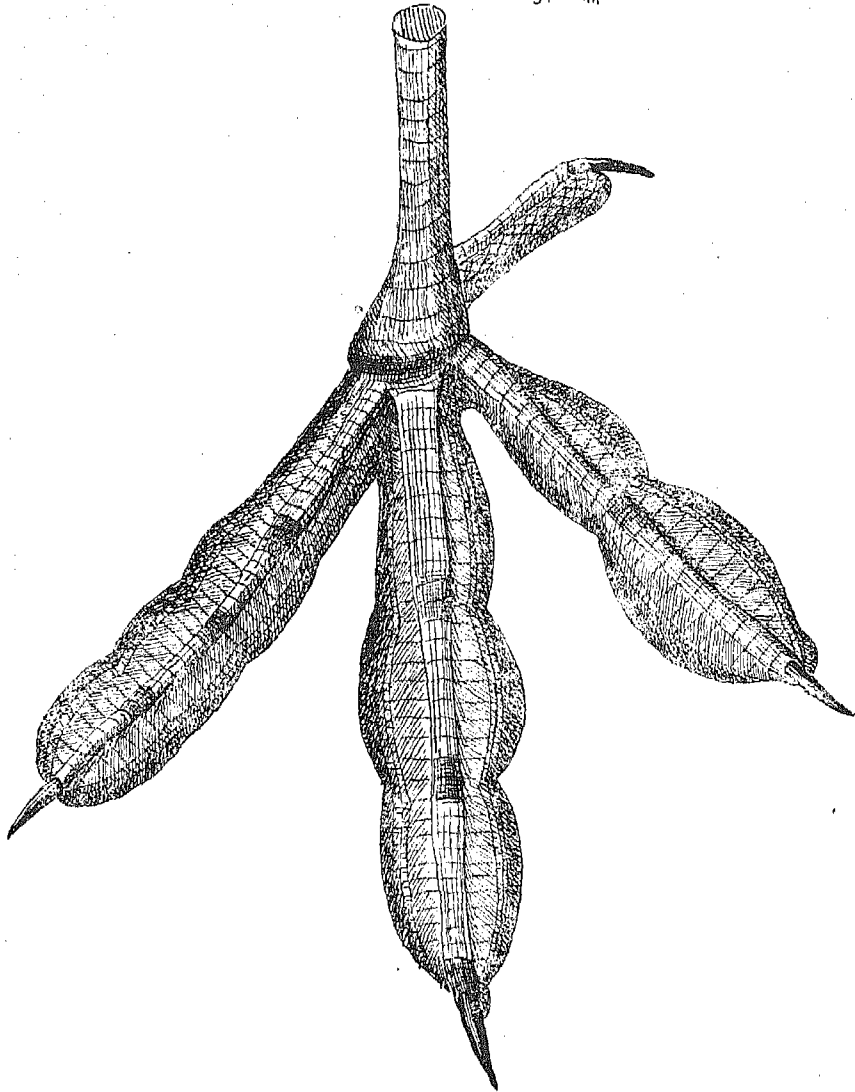
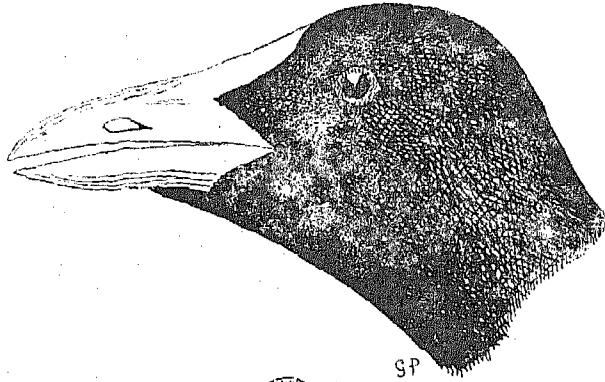
We have dealt with the ducks, swans, geese and mergansers. There are many other birds that are quite as much at home in the water as the above-mentioned, but which are not accounted sporting birds. These form our present subject. The descriptions given of them and other non-sporting birds that follow will be of a different nature from those for game birds, because these last are shot and the observer has the opportunity of holding them in the hand and observing them feather by feather. On the other hand, no one but a bird-collector shoots non-game birds; in consequence, I shall endeavour to give such descriptions of these as will enable the reader to identify them when he sees them in their natural surroundings.

Of one of these, namely, the coot (*Fulica atra*), mention has already been made, not because it is a near relative of the ducks, but because it apes the manners of these and is so often mistaken for one of them by inexperienced sportsmen.

Orthodox naturalists are never tired of dilating on the wonders of mimicry in nature. Mimicry, as the term is used by biologists, means similarity in external appearance between two species not closely related to one another. The term includes the resemblance of an animal to a vegetable or inanimate object. The stock example is that of the Kallima butterfly, common in the Himalayas, which, when at rest, bears a close resemblance to a dead leaf. The theory is that the butterfly, on account of its resemblance to a dead leaf, often escapes being devoured by the creatures that prey upon it, and that therefore natural selection has developed the likeness. This is putting the cart before the horse. It is wrong to say that natural selection brings about the resemblance. So great is the number of species and so plastic are they that it is not surprising that widely separated forms sometimes resemble one another. There are cases of birds that inhabit different parts of the globe being as alike as two pins.

In such cases neither can profit from the resemblance. The coot does not appear to derive any benefit from its resemblance to the duck; on the contrary, many a coot has lost its life because it has deceived inexperienced sportsmen. In this case it is similarity of habits that has brought about the likeness. The coot is a rail that has become a

swimming bird and which, instead of skulking among reeds, as the rest of its family do, lives on the open water. More will be said about it when we discuss the rails.

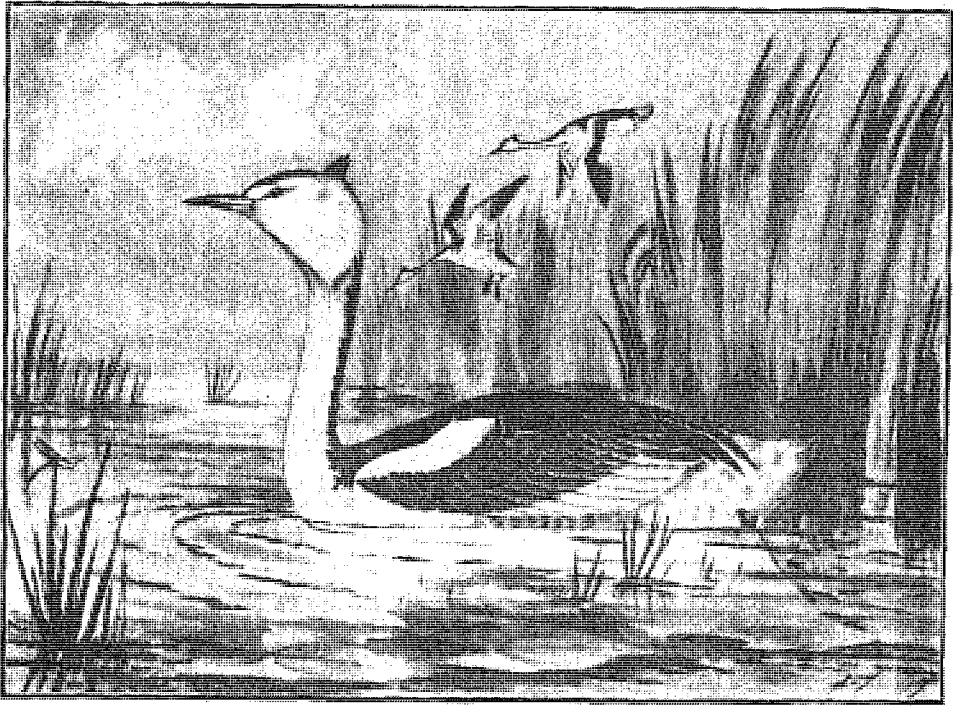


HEAD AND FOOT OF COOT.

I.—Grebes.

Let us now consider the grebes, which have many of the habits of ducks.

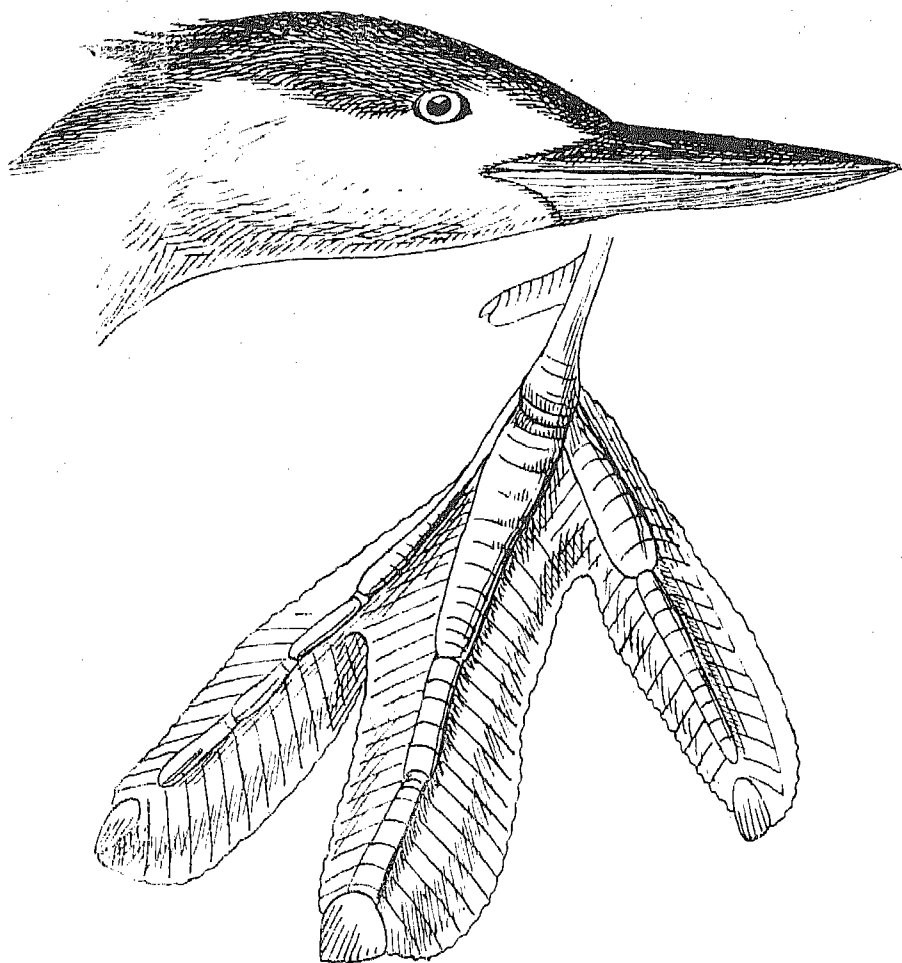
The great-crested grebe (*Podiceps cristatus*) occurs both in Europe and Asia. In winter, it is found on most of the big *jhils* in Northern India. It keeps to open water and is often seen near a flock of ducks. It obtains its food entirely by diving. It can swim very fast under water. When hustled, it takes to its wings. Like the coot, it experiences some difficulty in rising; it has to run on the surface for some yards, flogging the water with wings and feet, before it can rise. Once on the



GREAT CRESTED GREBE (*PODICEPS CRISTATUS*).

wing, it flies strongly but never soars high over the water as ducks and coot do. When on the wing, its long neck, slender-pointed bill, and the feet projecting behind the tail prevent its being mistaken for a duck. When flying, its wings are seen to be black and white and its body looks black. When it moves about on the surface of the water, the greater part of the body is submerged; in other words, it swims low. It carries the long neck upright and from a distance looks somewhat like a cygnet; this resemblance disappears on closer inspection. The pointed bill and the short "horns" formed by the black bifid crest

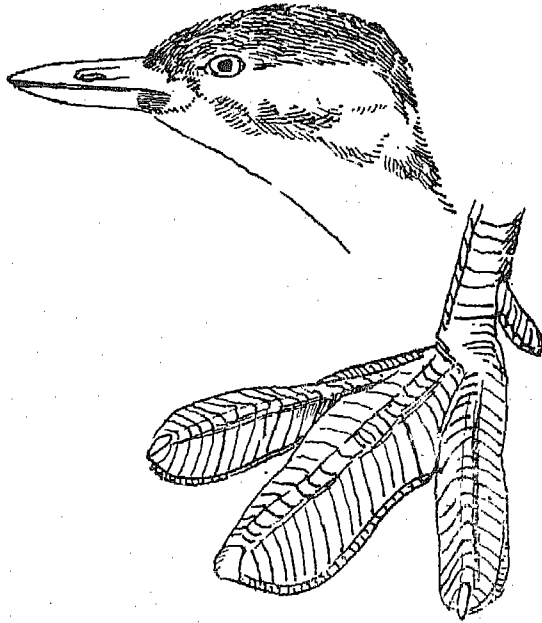
are very distinctive. The hind toe of the grebe is like that of a diving-duck. The three front toes are lobed like those of the coot, with this difference, that the lobes are not constricted at the joints of the toes. The plumage of the crested grebe is white, save for the crest described above, the brown hind neck, and some black on the forehead and wings.



HEAD AND FOOT OF GREBE.

The little grebe or dabchick (*P. albipennis*) is a permanent resident of India and is found on most *jhils* and ponds. This bird is not much larger than a myna. It looks like a diminutive brown teal that has lost its tail. It seems never to come on to dry land and it does not fly very often. It is, perhaps, the most aquatic bird in existence. The chin is white, as is the abdomen, and there is some chestnut on the sides of the head and the neck. The remainder of the plumage is dark brown.

The third grebe found in India is intermediate in size between the two that have been described. It has a white breast, and the chin and throat are mixed black and white. There is a broad, dark band



HEAD AND FOOT OF DABCHICK.

between the throat and the breast. It is known as the eared grebe (*P. nigricollis*). It occurs chiefly on salt water and, except in Sind, is a rare bird.

II.—Terns.

The terns now claim our attention. In these the three front toes, like those of ducks, are joined by a web, but the hind toe is small (wanting in some forms) and raised above the plane of the front toes. It appears to be of no use to the bird. Owing to the want of this toe a tern cannot perch on a bough and it is a poor walker; it takes very little walking exercise. Notwithstanding the webbed feet, terns very rarely swim on the water as gulls and ducks do. When not resting on a sandy islet in midstream, they fly to and fro a few feet above the surface of the water catching insects after the manner of swallows, hence terns are sometimes called sea-swallows. It is hardly necessary to state that terns are not near relatives of swallows. They frequently pick their food—aquatic insects or small fish—from the water, swooping on to it; sometimes they dive right into the water after the manner of kingfishers. So neatly do they secure their prey that the feathers of the head seldom get wet. Terns are among the most beautiful of God's

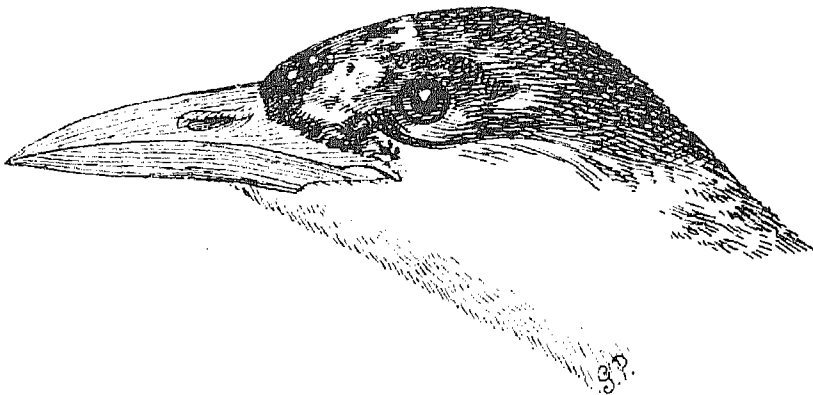
creatures. The beauty of their form is perfect. Their shape is a dream of comeliness and their movements are the poetry of motion.

The body is usually white and the long pointed wings are pearly grey. The bill and legs are often red or bright yellow.

Wherever there is a river or lake in India, there will you see terns. You cannot mistake a tern; the slim white body the long racing wings, the easy flight and the frequent descent to the water are a combination of characteristics peculiar to these feathered exquisites.

Although it is quite easy to identify a tern as it flies overhead, it is quite another matter to say to what species the particular bird belongs. In India the bird-lover is embarrassed by the vast number of species. The feelings of a naturalist, accustomed to the out-at-heels avifauna of Europe, when he first comes to India, are akin to those of a child taken to a toy shop at Christmas time and told to choose the toy he likes best. In England, we speak of the cuckoo, the kingfisher, the starling. In India there are 29 different kinds of cuckoo, 18 species of kingfisher, and 29 starlings. There are no fewer than 19 terns in India and the reader who wants full information is referred to the bird volumes of the *Fauna of British India* Series. Of these, 19, there are 6 which may fairly be described as common birds: the whiskered, Caspian, gull-billed, Indian river, black-bellied and little tern. Most species are about the size of a pigeon, but, of course, very different in shape. The little tern is no larger than a bulbul, while the Caspian tern is as big as a duck. A tern with a black head, not much larger than a sparrow, is the little tern (*Sterna minuta*). The Caspian tern (*Hydroprogne caspia*) is marked by its large size and its massive, bright-red bill.

The Indian river tern (*S. seena*) is, perhaps, the most abundant of the terns and is marked by the black cap, the bright-yellow bill and by



HEAD OF RIVER-TERN.

the fact that the outer feathers of the tail are nearly six inches longer than the middle ones, forming a very conspicuous fork.

The gull-billed tern (*S. anglica*) has a black bill and feet, but very little black in the plumage. As it flies, it appears to be a white bird.

The black-bellied tern (*Sterna melanogaster*) is very easy to identify, being the only one of which the under parts are black during the winter months. It is very common on the tanks of northern India.

The Indian whiskered tern, or small marsh tern as Jerdon calls it, (*Hydrochelidon hybrida*) has a red bill, a black spot in front of the eye and a black band behind the eye. The rest of its plumage is grey or white in winter. In the hot weather the whole head and the abdomen become black. In the hot weather it is not very easy to tell the difference between the black-bellied and the whiskered tern, when these birds are flying over a tank. The whiskered species, however, is smaller, being ten inches long as opposed to the thirteen inches of the black-bellied tern. The bill of the latter is yellow and that of the whiskered tern is red. Thus, it is possible to distinguish between these two birds even in summer without shooting them.

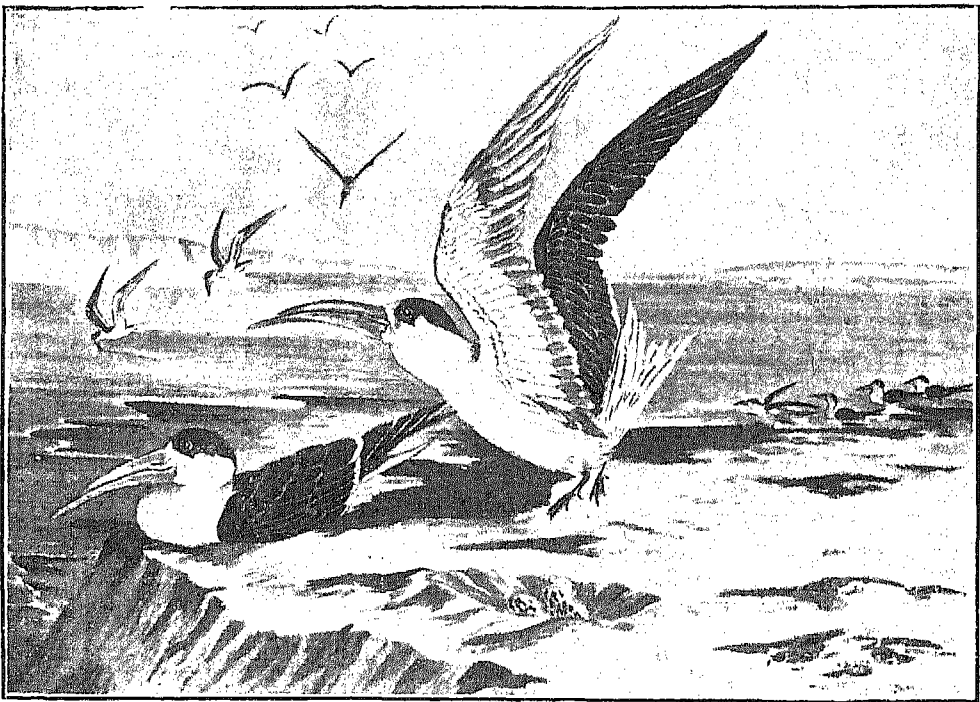
More detailed description would be as boring to the reader as to the writer, because terns, like wagtails, change their appearance with the season.

Terns usually live singly, but towards the end of February they begin to collect in flocks on sand islets in rivers, where they mate. They breed in colonies. Often on the same sandbank may be found the eggs of four different species of tern, the Indian skimmer, the spur-winged plover and the swallow-plover. The eggs of the various species are difficult to distinguish—all are marked in much the same way. The ground colour may be a pale shade of grey, green, pink or buff. The egg is copiously spotted and blotched or streaked with sepia or inky purple. Some of the markings are much paler than the others and have the appearance of being below the surface. The full clutch of eggs is three, sometimes two and very rarely four. Often there is great difference in the colouring of the eggs in the same nest. The eggs are laid on the bare sand in a slight saucer-shaped depression. Scores of nests are often to be seen on one sandbank. A most entertaining morning may be spent on any such sandbank in the month of April. As soon as the observer lands, the nesting terns fly just over his head and utter their shrill plaintive cries. If they do not act thus, there is no need to look on that part of the bank for eggs, for it will contain none. During the daytime terns do not appear to sit on their eggs at all. They rely on the heat of the sun to do the hatching; indeed, so powerful are the rays of the sun, that it is a wonder that the eggs do not get *cooked*; they are often too hot to handle with comfort! By night every egg is covered by its owner and, when it is dark, the birds sit so closely that Hume declares it to be possible to catch them in a butterfly-net!

The above remarks do not apply to the Caspian tern, which nests by the sea, or to the whiskered tern which breeds in the rains among the reeds and floating water plants of *jhils*. Thousands of these terns breed on the lakes of Kashmir and Oudh. The nest is a floating raft made of reeds or straw, on this three eggs are laid: these are pale green speckled with brown and pale purple.

Why this tern should have departed from the nesting habits of all its near relatives is a question that has not yet been answered.

The Indian skimmer or scissors-bill (*Rhynchops albicollis*) is a near relative of the terns. This very extraordinary bird is found on most of the large rivers of India and is particularly common at Ghazipur, on

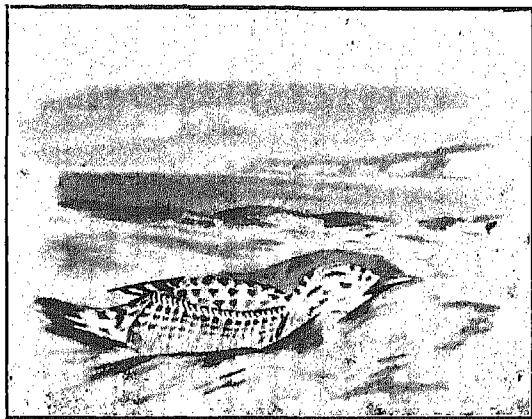


SKIMMERS (*RHYNCHOPS ALBICOLLIS*.)

the Ganges. The skimmer is sixteen inches long, being thus a little smaller than the largest tern. The bill of this bird is a unique structure. Except at the tip, where it is horn-coloured, it is of a bright-red hue. It is much flattened laterally; the upper mandible, which is three and a half inches long, is an inch shorter than the lower one, which is very flexible and makes a good paper-knife. The tail, the whole of the lower parts, the forehead, the cheeks and a collar at the back of the neck are white, the rest of the plumage is blackish brown. This bird is called the skimmer because of its habit of flying just above the surface of the water, so close to it that it is a marvel that the tips of its long wings

never touch the water. When it is thus scouring the surface, the bill is carried wide open with the tip of the lower mandible immersed in the water, cutting through it just as the nose of a destroyer does. Cut-water would be a better name for the bird than skimmer. Every now and then the head is jerked down and the mandibles meet with a snap to close upon a tiny fish which is usually swallowed at one gulp. You cannot mistake a skimmer: it is the only bird in India that has this habit of flying with the bill in the water.

Skimmers nest on sandbanks in rivers along with the terns, and lay four eggs, much like those of terns except that the markings are usually



YOUNG SKIMMER IN CAVITY IN SAND, FEIGNING DEATH TO ESCAPE DETECTION.

bolder. The nest is just a depression in the sand, usually shallower than that of a tern. Baby skimmers are very sluggish and invariably feign death when handled.

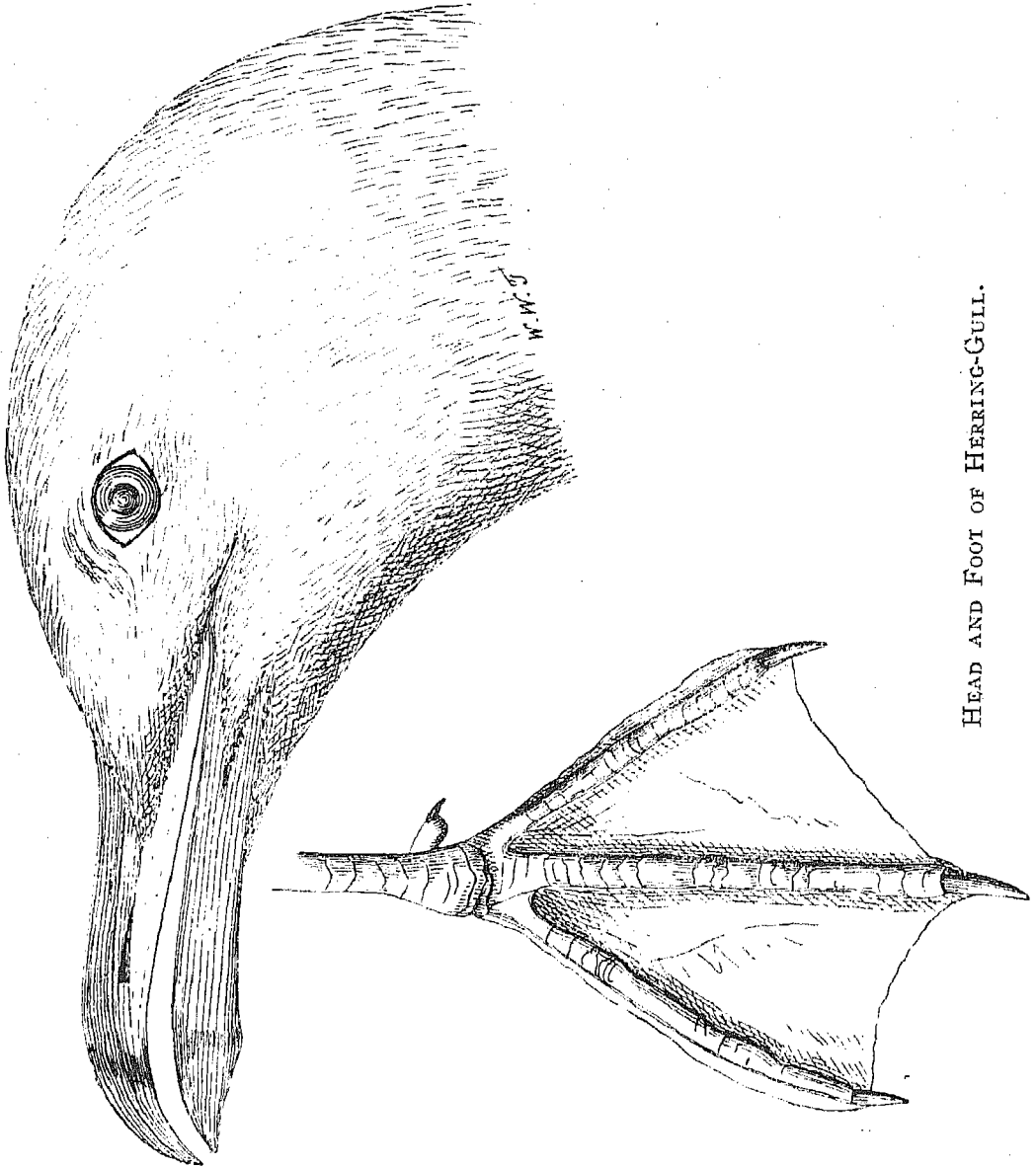
When I speak of feigning death, of course, I do not mean that the young birds deliberately pretend they are dead. They have no knowledge of death, and if they had they do not possess the intelligence requisite to make pretence in order to deceive man. Tern nestlings are much more active than are young skimmers.

III.—Gulls.

The gull is just a heavy tern; it stands in much the same relation to the tern as a barndoor fowl does to a bantam. The plumage of gulls, like that of the terns, is mainly white and pearly grey. The several species resemble one another closely and are always changing their appearance.

I shall, therefore, not attempt any detailed description: those who love these dry bones of science are referred to the bird volumes of the *Fauna of British India* Series, which, by the way, are perhaps the best

systematic bird books in existence. They are now out of print, and the Secretary of State for India is bringing out a new edition, but alas! the whole terminology is being changed, with a result that the field naturalist will be put to great annoyance. He has already suffered over much at the hands of the pedant! The only gull that ventures far inland



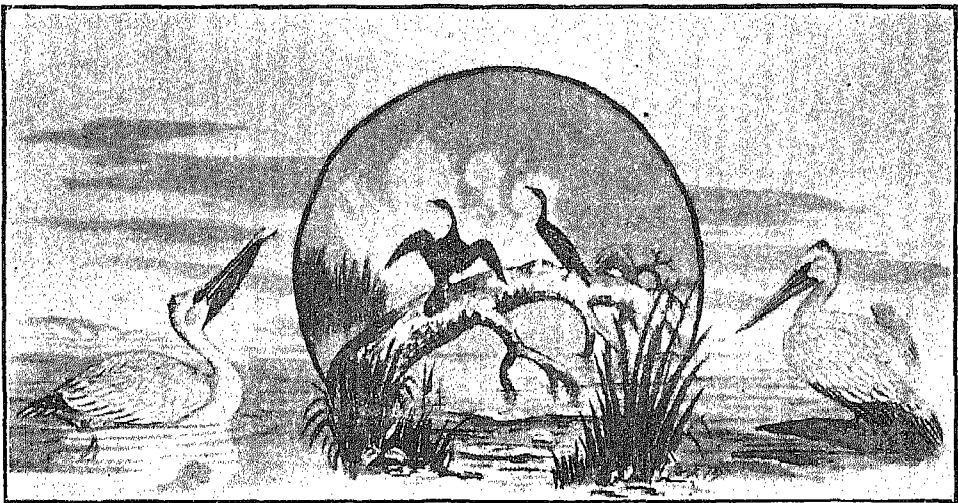
HEAD AND FOOT OF HERRING-GULL.

in very large numbers in India is the yellow-legged herring gull (*Larus cachimans*). One or two specimens of this are likely to be seen on most large *jhils* in India. The brown-headed gull (*L. bruncicephalus*) sometimes occurs on rivers. Of the gulls that frequent the coasts of India, perhaps, the commonest is the laughing-gull (*L. ridibundus*).

The ugly brown gull seen in such numbers in the Red Sea is the sooty gull (*L. hemprichi*). This bird occurs on the coast of Sind. Gulls feed chiefly on dead fish and garbage floating on the sea or washed up on to the shore. At Madras they squabble with the crows for the tiny fish thrown away by the fishermen. Inland, gulls feed largely on insects and worms, but an egg or a young bird does not come aniss.

IV.—Pelicans.

Before taking leave of the web-footed birds, mention must be made of the pelicans and cormorants. These are peculiar in that the hind toe points forwards, and this and the three front toes are connected by a web. It is not necessary to describe a pelican. Which of us has not watched with admiration these birds in the Zoo, scooping up fish with



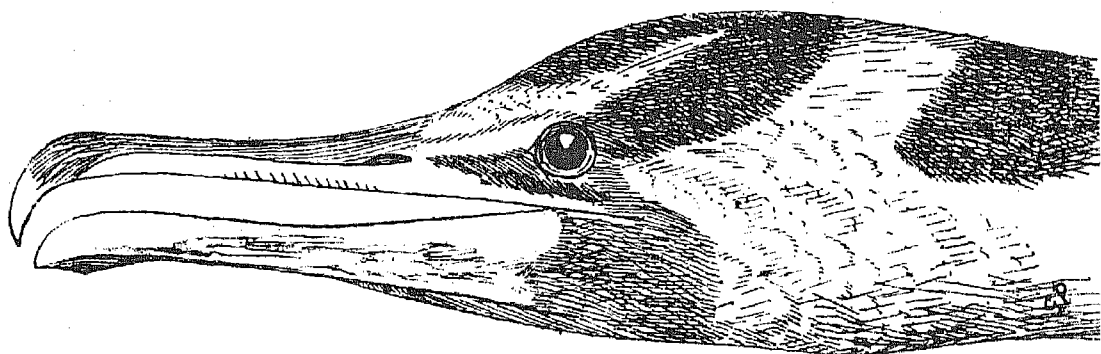
PELICANS (*P. PHILLIPINUS*) AND CORMORANTS (*PHALACOCORAX JAVANICUS*.)

their elastic-pouched lower jaw? A party of pelicans fishing in the wild state is a sight for the gods. They line up, one or two deep, across a belt of water and then advance, beating the water with their wings. Thus they drive the frightened fish to shallow water, where they scoop them up much as a bank-clerk scoops up sovereigns. Four species of pelican occur in India. They are as like one another as the figures of human beings in a Noah's ark are, so that it is almost impossible to say to which species a specimen belongs without examining it closely and measuring it with a foot-rule.

V.—Cormorants.

Cormorants occur much more abundantly in India than do pelicans. These great, black, fishing birds are to be found on most big *jhils* and sheets of water in India. They live on fish, which they capture by diving. Now a fish in the water takes a lot of catching! Until you have witnessed cormorants diving for fish in the glass tank at the Zoological Gardens in Regent's Park, you cannot appreciate the pitch of excellence to which the cormorant has brought the art of swimming under water. The heathen Chinese takes advantage of this proficiency and makes cormorants fish for him. He ties a line to the bird's leg, winds a ring of twisted straw round its neck, and then sends it into the water after fish. The unfortunate bird cannot swallow its quarry owing to the ring round its neck, so it has to disgorge when pulled back into the boat. To prevent the bird from sulking, the master gives it a fish now and again after a capture.

After having partaken of a meal of fish, cormorants fly to any convenient post, there to digest their food and ponder over the wicked-



HEAD OF CORMORANT.

ness of the world. While thus engaged, they stand motionless with wings expanded, looking like the tops of partially submerged church lecterns.

Cormorants are strong on the wing but, like coots, they experience some difficulty in rising out of the water. There are three species of cormorant in India—all as black as crows. The commonest is the little cormorant (*Phalacrocorax javanicus*). This bird is particularly abundant in the neighbourhood of Madras. It breeds during the south-west monsoon in northern India and in the south-east monsoon on the Madras side. The nests are platforms of sticks placed in low trees, often on an island in a lake. The eggs are pale green. The large cormorant (*P. carbo*) is also fairly abundant. Between these two comes the lesser cormorant (*P. fuscicollis*). This seems to occur chiefly in Sind and Burma. It, like the little cormorant, has twelve tail-feathers,

while the big species has fourteen. No matter how much the naturalist conjures with the name "Natural Selection," he will be hard put to it to explain why two of our Indian cormorants get along very nicely with twelve tail-feathers, while the big one needs fourteen.

The Indian darter or snake-bird (*Plotus melanogaster*) must be familiar to all who shoot duck. This bird is half cormorant, half heron. Cover up the head and neck and you think you have a cormorant. Leave only the small head and long slender neck exposed, and you imagine you are looking at a heron. This species is to be found on most *jhils*. It feeds on fish, which it catches by diving from a perch like a kingfisher, or from the surface of the water like a cormorant. Often the snake-bird swims with only the head and neck showing above the surface, like the periscope of a submarine. After a meal the bird assumes the lectern-like attitude of cormorants. It is a good flier and, when on the wing, carries the neck stretched out and has then a queer appearance, looking as though it had exchanged head and neck with a bird of much thinner build than itself. Its nest is like that of the cormorant, in the company of which it often breeds.

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NON-PERCHING WADERS.

I.—Water-Plovers and Rails.

We have discoursed upon the sporting and the non-sporting swimming birds. There is a host of other water-fowl, many of which are entitled to a place among the common birds of India. These form a heterogeneous crowd, hence it is not an easy matter to know how to group them for descriptive purposes. After some consideration I have decided to make four classes of them: I.—Water-Plovers and Rails. II.—Plovers and Sandpipers. III.—Cranes and Flamingoes. IV.—The Perching Waders—Storks, Ibises and Herons.

In this chapter we will notice the more important members of Class I.

The birds I have termed water-plovers are usually called jacanas, which is the Spanish name for them. These remarkable birds are to be found on most of the lakes in the tropics and sub-tropics of Asia, Africa and America. They belong to the family *parridae* and two members are common in India. These are the pheasant-tailed jacana or water-plover (*Hydrophasianus chirurgus*) and the bronze-winged species (*Metopodius indica*).

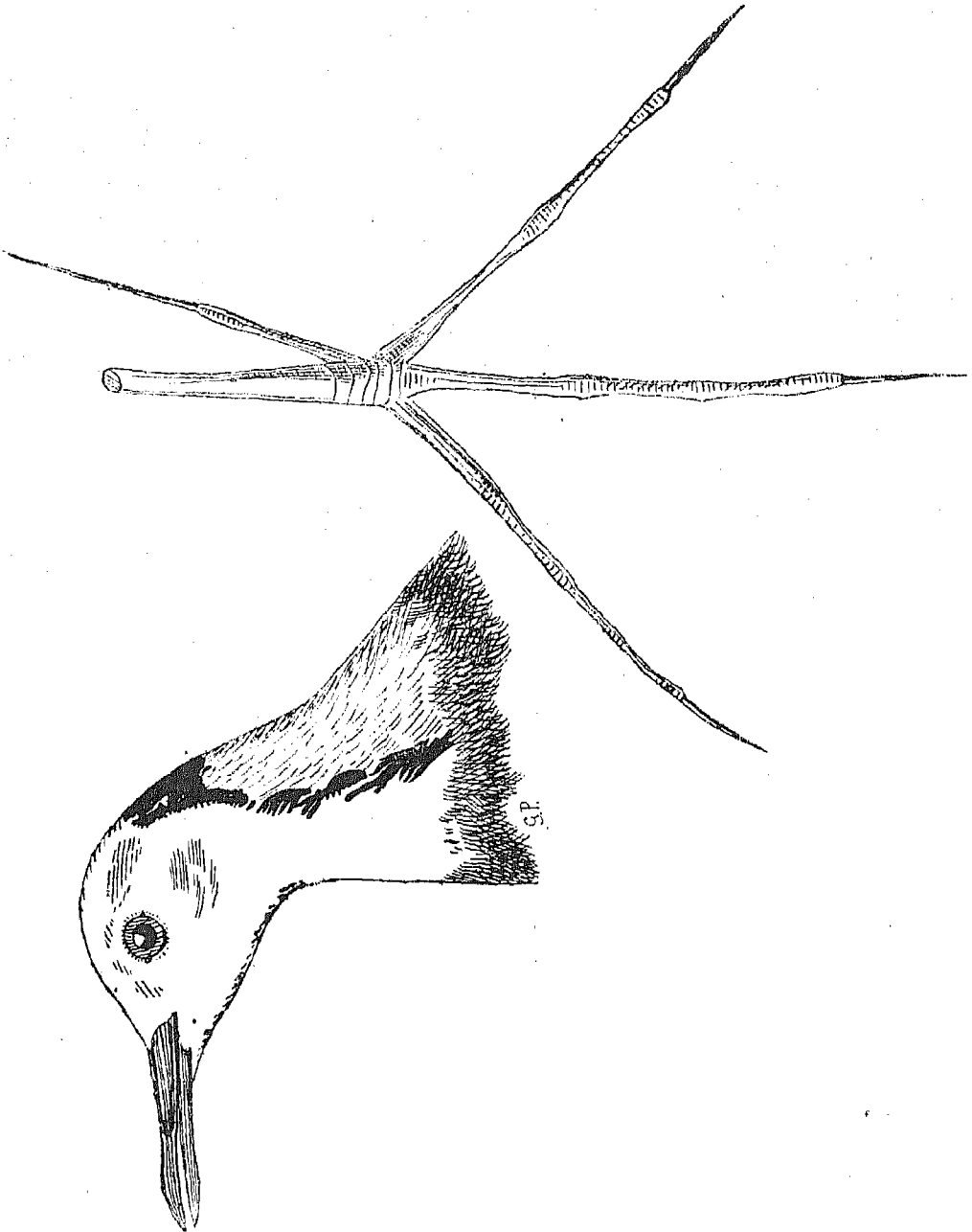
Every one who has shot duck in India, must have heard emanating from the reeds, curious calls, not unlike the mewling of cats. These calls are the notes of the water-plovers. As the boat that carries the gunner progresses, the occupant must have noticed small birds, about the size of pigeons, get up well within range and fly off, uttering, as likely as not, a mewling call. These are water-plovers. One is a light coloured bird and the other dark. If the sportsman be observant, he may have noticed that these birds carry their legs pointed backwards when flying and these are so long as to project behind the tail.

If you look at the bird through field-glasses, you will see that in the pheasant-tailed species the crown and upper plumage are brown, that there is a black band running through the eye down the neck and then turning forwards to form a black gorget. Behind this, running down the neck, is a yellowish brown band. The lower plumage is white. The wings are white, with narrow black edges. The tail is short; you will, therefore, wonder why the bird is said to be pheasant-tailed. If, however, you repair to the *jhil* in the rains, you will cease to wonder, for then both the cock and the hen have a long pheasant-shaped black tail. The head is then white and the black band runs from the nape down the side of the neck and the yellowish brown band has become bright golden.



A. WING OF PHEASANT-TAILED JACANA FROM ABOVE. Note spur and curious shape of first and fourth primaries.
B. UNDER-SIDE OF WING SHOWING SPUR.

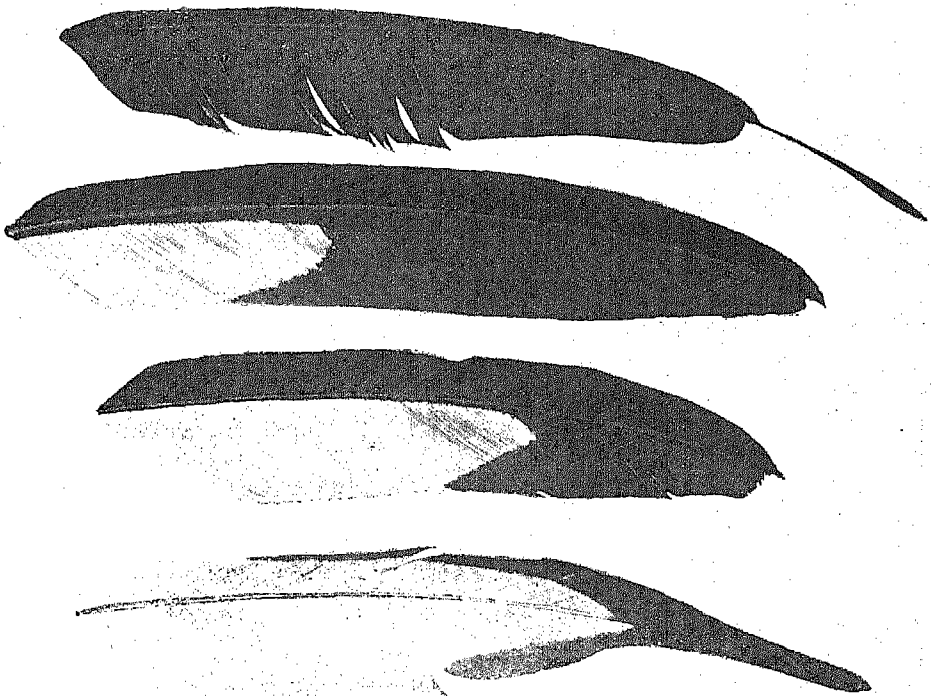
In the case of the bronze-winged jacana, the prevailing hue of the plumage is rich dark green with a beautiful gloss, which is purple on the upper back and bronze on the wings. The lower back is maroon with a purple gloss. There are conspicuous white eyebrows and dark



HEAD AND FOOT OF JACANA.

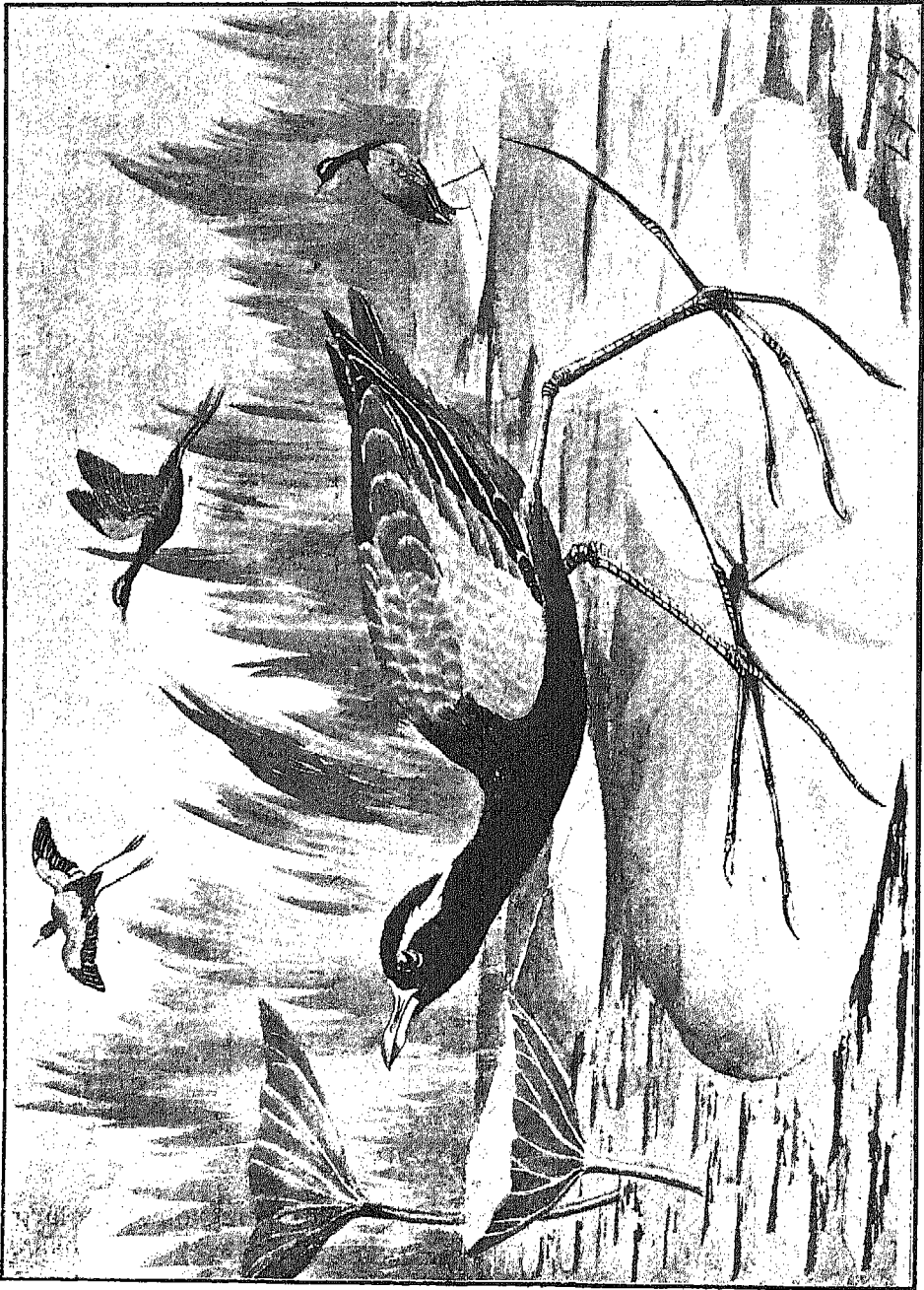
blue lappets. Both sexes are coloured alike and there is no seasonal change of plumage in this species as there is in the case of the pheasant-tailed species. Here then we have two birds living side by side on the same *jhil*, and of which the habits are identical, yet one adopts a special nuptial plumage, while the other does not. This is a phenomenon

which the biologist has not been able to explain: for this reason jacanas are left severely alone by those scientific men who write on sexual selection and protective colouration! The most extraordinary thing about these birds is their long toes. The birds are smaller than pigeons, nevertheless, the hind toes and claws are nearly four inches in length, while the three front toes are well over three inches. Owing to the extravagant length of their toes these birds are able to run about on the broad floating leaves of lilies, lotuses and other water plants as easily as an ordinary bird can run on *terra firma*; for this reason they might well be called lotus-birds or lily-trotters. But they can, and often do, ride the water like ducks. The pheasant-tailed species looks a fine object on the water after it has grown its long tail. This is raised above the water in a beautiful curve. Water-plovers are more aquatic even than duck; they do not often come on dry land. Their nests are floating rafts, and as often as not their eggs are partly immersed in the water!



FEATHERS OF JACANA.

Take a cloudy day in the rains and spend the morning on some large *jhil* where there is plenty of vegetation and you will enjoy the experience. You will almost certainly find nests of these and other water birds. Both kinds of water-plover build the same kind of nest—a tangle of rushes which may float like a raft, or may be tethered to some plant or floating object, or may be on a tiny islet in the middle of the *jhil*. You may find the nests of both kinds on the same *jhil*, but in that case they

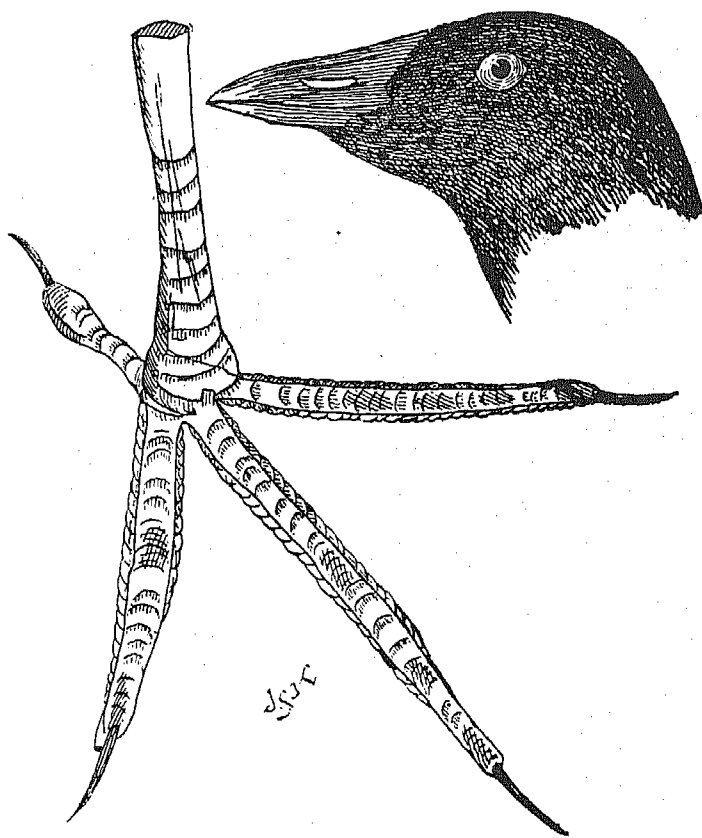


BRONZE-WINGED JACANA (*METOPODIUS INDICA*).

usually divide off the *jhil* into two spheres of influence, as there is some rivalry between the two species. The eggs of the two kinds of jacana are easily differentiated. The pheasant-tailed species lays four peg-topped-shaped eggs of a rich olive or bronze hue without any markings. Those of the bronze-winged jacana are more or less covered with markings which look like Arabic inscriptions.

Both species are found all over the plains of India, except the Punjab, where only the pheasant-tailed species occurs. The bronze-winged bird is likely to be seen on the lakes of the Botanical Gardens at Sibpur and the pheasant-tailed species is said occasionally to pay the gardens a visit.

Another bird that is to be seen on most lakes in India is our familiar English friend, the moorhen (*Gallinula chloropus*). This bird is found



HEAD AND FOOT OF MOORHEN.

all over India, but is not nearly so common as are the water-plovers, and, being of very retiring habits, is apt to elude observation where it does occur.

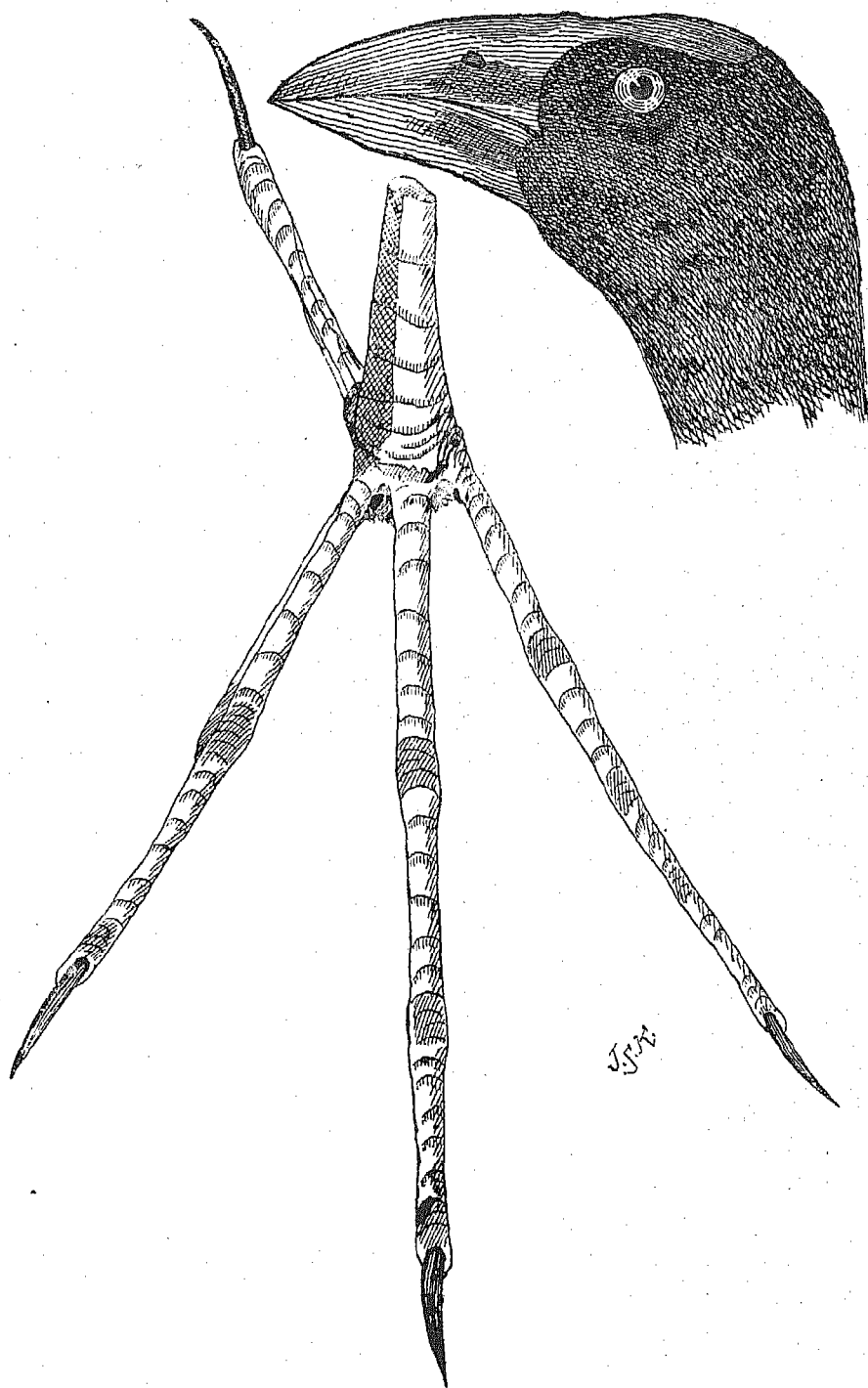
An olive-brown bird, not very much larger than a myna, with some white in the posterior part of the body and a conspicuous red shield on the forehead—a bird that haunts the reedy margins of *jhils* and swims

to cover with jerky movements when it perceives that it is being observed can be none other than the moorhen. This bird has normal toes and can run well on land. When it runs it cocks up its tail, causing the white under-parts to be very conspicuous.

The moorhen breeds in August and September. To make a receptacle for the eggs, fourteen or fifteen stems of wild rice are bent down to form a sort of cup. In this a goodly number of eggs is laid, sometimes as many as nine. These are usually stone-coloured or pinkish, with brownish red spots. Occasionally the bird makes a collection of rushes and straws and with these builds a nest in some bush growing in the lake.

One of the most beautiful birds found on our Indian *jhils* is the purple coot or moorhen, as Blanford calls it. The scientific name is *Porphyrio poliocephalus*. This bird, as I have remarked elsewhere, is one that should appeal strongly to Messrs. Liberty and Co., being a study in shades of art blue. Purple, lilac, cobalt blue, greenish blue all preponderate in one or other parts of the purple plumage of this bird. The whole plumage is some shade of purple except a patch under the tail which is white. The bill and a shield of skin are bright red, as are the long legs. The purple coot is about the size of a small whistling teal. Its habits are very different from those of the black coot. It has no lobes on its toes as the black coot has, but its long toes, like those of the moorhen, are fringed with a membrane which should enable the bird to swim. It may perhaps swim like a moorhen, but I have never seen it do so. Indeed, I have never seen a purple coot in the open, except on the wing after it has been flushed. It is said that, owing to its long toes, it can run about on the top of the broad floating leaves of water plants as water-plovers do. I have never seen it act thus. I have always found the purple coot among rushes and stout reeds to which it clings in much the same way as a reed-warbler does. Its diet is chiefly vegetable and it is said to cause much damage to the rice crops. It has a harsh cry. The nest is of the same description as those of the water-plovers—a mass of rushes and reeds, which may be floating or on the ground on an islet in the *jhil*. If the nest be a floating one, it is a massive structure, four-fifths of which is under water. As many as nine eggs may be laid. These have the ground colour pale pink, very prettily marked, especially at the broad end, with lines and spots of crimson lake; in addition to these there are some pale purple blotches and clouds which appear to be below the surface of the shell. July and August are the months in which most eggs are found in Northern India. If a person be fortunate he may find on the same *jhil* on the same day eggs of all the birds described above.

One of the commonest water-birds in India is the white-breasted water-hen (*Amaurornis phænicurus*).



HEAD AND FOOT OF PURPLE MOORHEN.



(PORPHYRIO POLIOCEPHALUS) PURPLE MOORHEN AND (FULICA ATRA) COOT.

This bird is found not only in large tanks, but, like the paddy bird it is quite content to dwell in the smallest village pond, provided this affords the least cover to which it can resort when alarmed.

It is about the size of a crow, but has much longer legs. The upper plumage is dark slaty grey, tinted with green—seen from a distance it looks black. In sharp contrast to this is the white forehead, face, front of neck, breast and belly. There is a chestnut patch under the tail; as this organ is often carried aloft the chestnut patch shows up well. The long legs are yellowish green. The bird feeds on the ground and among rushes to which it is able to cling with ease, thanks to its long feet. This bird is often found some distance from water. Although it dwells near human habitation, it objects strongly to being looked upon by man, and walks away hastily with tail erect whenever it knows you are watching it. This bird nests in the rains, when it becomes exceedingly noisy. Hume thus describes the uproar made by water-hens in September—some half-dozen of these birds were breeding near his house at Bombay which was surrounded by low-lying fields. "Any thing more unearthly proceeding from the throat of a bird I never heard. It began with loud harsh roars which might have been elicited from a bear by roasting it slowly over a large fire, then suddenly changed to a clear note repeated like the coo of a dove. Often in the morning two or three of these birds might be seen in some little open space, fighting like young cock-chickens."

The nest is sometimes on the ground in rushes, more often in trees or bushes standing in water. The nest is a platform of twigs, rushes and grasses—occasionally the disused nest of another bird is utilised.

Young water-hens are pretty objects and swim well, when they look like fluffy black ducklings.

A small relative, about the size of a myna, of which the under-parts are chestnut instead of white, which is fairly common in the pools round about Calcutta, is the ruddy crane (*Amaurornis fuscus*).

II.—Plovers and Sandpipers.

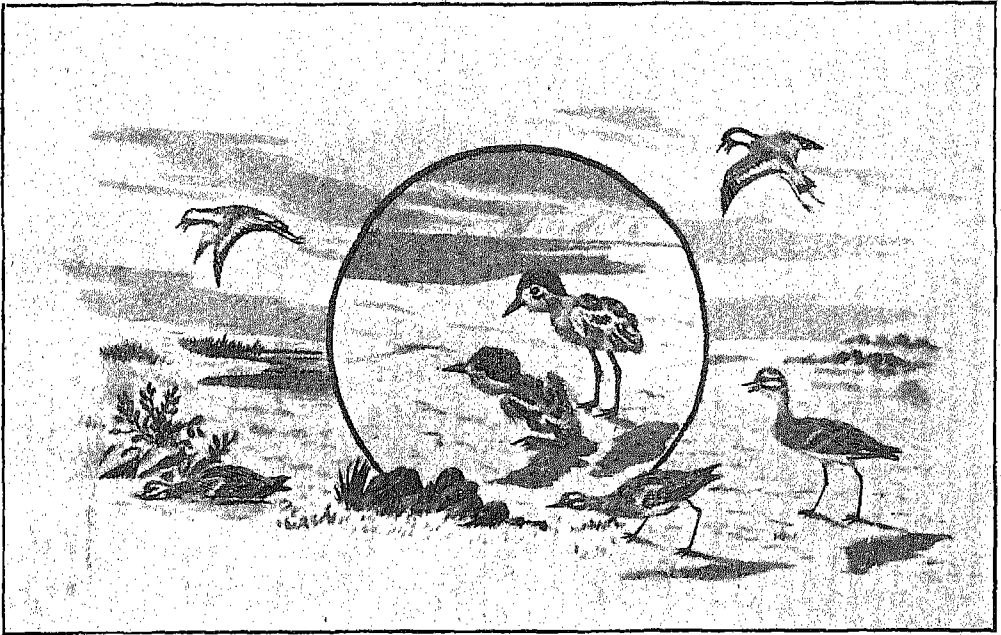
"The plovers, sandpipers and snipe are so nearly allied," writes Dr. Blanford, "that they must all be united into one family." I am going to defer so far to the opinion of the learned doctor as to treat of plovers and sandpipers together, but the snipe, being sporting birds, have been dealt with along with others of that ilk. Now there are about fifty species of plover and sandpiper in India, but we will consider only about ten of the commoner ones. Plovers always remind me of certain men I knew at 'Varsity, who invariably went about in riding breeches and gaiters, but who were never seen on horseback. Some unkind people went so far as to say that those horsey young men could



WHITE-BREADED WATER-HEN (*AMAUORNIS PHOENICURUS*).

not ride! A plover is a bird dressed, or perhaps, I should say built, for wading, that never wades deeply. Plovers have long legs, but they are birds of meadows, and grassy and sandy tracts, rather than of marshes. They are often seen near water, but seem never to venture far into that element.

The most familiar of the Indian plovers is the did-he-do-it or red-wattled lapwing (*Sarcogrammus indicus*). Lapwing is another name



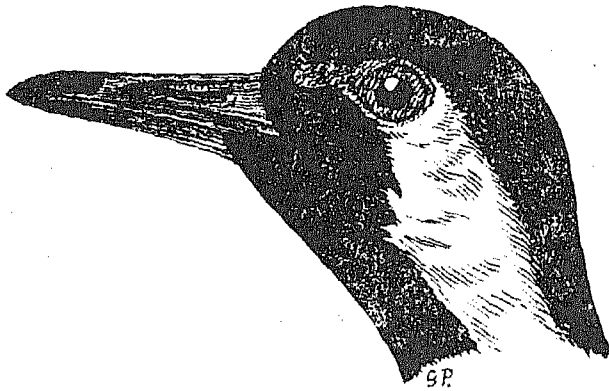
YOUNG SPUR-WINGED PLOVER IN THE CENTRE; RED-WATTLED LAPWINGS (*SARCOGRAMMUS INDICUS*) FLYING; STONE-CURLEWS (*OEDICNEMUS SCOLOPAX*) RUNNING AND SITTING.

for plover. Montagu tells us that the English lapwing (*Vanellus vulgaris*), which is found as a rare bird in North-Western India, is so called because of "the constant flapping of the wings during flight." This is not very illuminating; most birds flap their wings during flight! Lapwing is probably a corruption of kleape-wince. Our forefathers so named the bird because of the leaping or jerking antics it performs on the ground when a human being approaches its eggs. Kleapen means leap or run, wince means move from side to side.

The head, neck and upper back of the did-he-do-it are black, and the lower back and under-parts are white. A broad white band runs down each side of the neck from the eye to join the white of the under-parts. The wings are of a beautiful greenish bronze hue, set off by a broad white band which meets the white rump and gives the bird a very striking appearance when it is on the wing. The legs are bright

yellow. The bill is crimson red, as is the forwardly-pointing wattle, which forms so conspicuous a feature of the bird's face.

Very likely the red-wattled lapwing in appearance is the yellow-wattled species (*Sarcophorus malabaricus*). As the name indicates, the wattle of this bird is yellow. The species lacks the white band on the side of the neck, but its wing markings are the same as those of the red-wattled species. Both birds have the same habits, their calls are very similar, they live in stony places and in ploughed fields. They seem never to eat or sleep. They lay four typical plover's eggs in the middle of a ploughed field or on the ballast of the railway line; sometimes on the roof of a house. The eggs are stone-coloured with light and dark



HEAD OF LAPWING.

brown blotches, but is it necessary for me, when talking to epicurean readers, to describe plover's eggs?

The red-wattled species nests from March to June, while the yellow-wattled lapwing seems to lay only in April and May.

Almost more handsome than the two birds just described is the Indian spur-winged plover (*Hoplopterus centralis*). This has greyish brown plumage with black and white markings. The pointed crest, which is usually recumbent, the greater part of the wings and tail, the chin and throat, and a band on the abdomen are black. There is a brown collaret and some brown in the wings. During flight the most conspicuous feature of the bird is a broad white wing band which meets the white rump and forms a pattern like that on the did-he-do-it. There is a spur on the front part of the wing which is difficult to make out unless the bird be held in the hand. The spur-winged plover seems to live entirely on sand near water. Two or more of these birds are to be found on every sand *chur* in the Ganges. The call of this plover may be syllabised, did-did-did-did-do-it, and is invariably uttered when the bird is on the wing. If you approach this bird, it will take to its wings and fly round you and scold in such a way that you think it must have a nest near by and is protesting because it fears you will



SPUR-WINGED PLOVER (*HOPLOPTERUS VENTRALIS*).
Note spur on shoulder of wing. This is usually concealed in the feathers of the neck.

plunder it. This may be the case, on the other hand it may not be. The spur-winged plover like the Indian agitator makes a point of protesting whether he has a grievance or not!

When it does not know you are looking at it, the spur-winged plover is a quiet enough bird. It lives with the head half buried in the shoulders. When it runs with mincing gait with the head in this position, it has a you-have-hurt-my-feelings-and-I-will-have-nothing-to-do-with-you air.

As with all plovers, when it squats, the legs point forward, causing the bird to look as though it were kneeling the wrong way. It lays four eggs on the bare sand. These are in shape and colouring like those of the did-he-do-it. March and April are the months in which to look for them. The baby spur-winged plover is not unlike a tern of similar age, but it has only three toes, and these are not webbed. I may here say that plovers and sandpipers have no hind toe, or only a rudimentary one; they are, therefore, unable to grasp a perch and so never sit in trees.

The legs of the baby spur-winged plover are black, its thick down is of a darker hue than that of the tern nestling, and has much the appearance of the fur of a tortoise-shell cat.

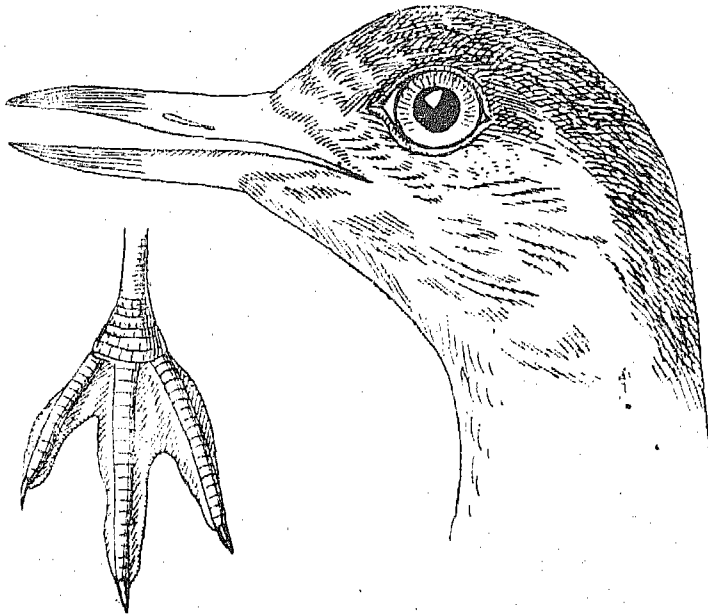
The golden plover and one or two other lapwings visit India in winter. One only of these is sufficiently abundant to require mention; this is the white-tailed lapwing (*Chettusia leucura*). A lapwing-like bird of sandy-coloured plumage and white tail and throat, having a black and a white wing bar, is probably this species. The white tail is so short that it is hidden by the wings, except when the bird is flying.

We now come to the sand-plovers. These are plovers which pick their food, as a rule, from off damp sand and do not mind getting their feet wet. They are small birds, varying in size from that of the sparrow to that of the myna. They usually go about in small flocks. They are dull brown birds with dark brown and white on the head. Sometimes the white takes the form of a necklace, then they are called ringed-plovers. Most of them are winter visitors to India, but two of them—the Kentish plover and the lesser-ringed species—sometimes breed in India. There are eight different kinds that occur in Hindustan; all belong to the genus *Ægialitis*.

Before passing on to the sandpipers, which are birds that obtain their food by probing in mud and wet sand, mention must be made of some other plover-like birds, the classification of which has somewhat puzzled men of science.

The stone-curlew or stone-plover (*Edicnemus scolopax*) is rather a large bird, being half as big again as the did-he-do-it. It is a drab-coloured fowl with a white eyebrow and black-and-white wings; these

the bird sometimes shows off by running about with them expanded. The large eyes are golden yellow. This bird is usually found on dry plains, which are not cultivated. It has the habit of crouching on the ground with its neck stretched out when it wants to conceal itself.



HEAD AND FOOT OF THE STONE-CURLEW.

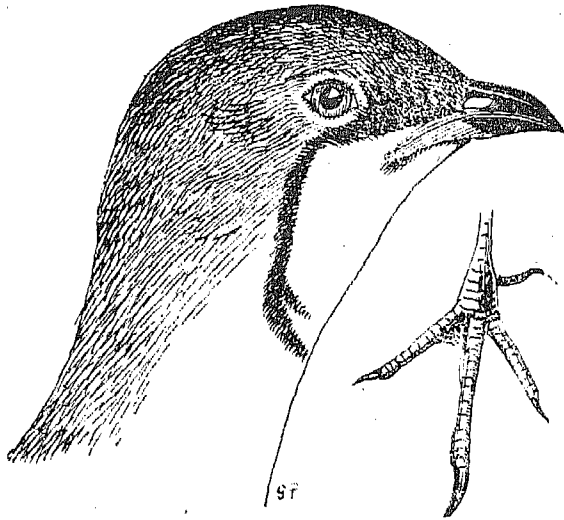
This is probably why it is sometimes called the bustard florican. It seems to spend most of the day in sleep; at night it becomes lively, and that is the time when its curlew-like call is most often heard. It lays its plover-like eggs on the bare ground.

The great stone-plover or thick-kneed or goggle-eyed plover (*Esacus recurvirostris*) is one of the largest of the plovers, being every bit as big as the average Indian *murghi*. It may be distinguished from the last-named species by a black band that begins behind the white eyebrow and encircles both this and the eye. This bird lives on the banks of large rivers, and lays, between February and May, two very large eggs on the sand or bare ground. "It is said," writes Finn, "to have a loud harsh croaking note, but I should call what I have heard from it a squeal, varying from the awful screech of slate pencil 'scrooped' perpendicularly down a slate—as we have all done in our youth—to a regular yell, almost like a pig's, when the bird is handled." From what has been said it will be gathered that the goggle-eyed plover—so called from its huge head and eyes—is not numbered among the song birds of Ind!

The handsome Indian courser or courier-plover (*Cursorius coromandelicus*) is less than half the size of the goggle-eyed. It is a bird of

stony, arid plains. The head and breast are chestnut. The chin is white, as is a patch above the tail. There are conspicuous white eyebrows which meet at the nape of the neck; below this is a black band running through the nape. The rest of the plumage is brown. The legs of the bird look as though they had been coated with white enamel. The eggs are of the usual plover type.

Swallow-plovers or pratincoles are curious little birds, the classification of which has puzzled ornithologists. There is a large and a



HEAD AND FOOT OF PRATINCOLE.

small variety—*Glareola orientalis* and *G. lactea*; the latter is a very common bird. Swallow-plovers are plovers that seem to aim at becoming swallows. They catch their insect prey largely on the wing; they have, therefore, developed some of the peculiarities of birds that seek their subsistence in this way, namely long wings and a broad gape.

If you would see a swallow-plover, repair to a river at eventide when there are plenty of insects disporting themselves over the water. These provide a feast for swallows and martins and swallow-plovers. These last are not very much larger than swallows, being less than seven inches in length. The wing is nearly as long as the head, body and tail combined, and it is this feature that makes these plovers look so swallow-like. The general colour of the bird is sandy grey. The chin is white, the short tail is white with a black tip. There is a black streak through the eye and a white one near the margin of the wing.

The legs are short for those of a plover, nevertheless the bird runs well, after the manner of lapwings. The nesting habits are those of terns and the eggs are usually laid at the same time and on the same sandbank as those of terns. The swallow-plovers generally form a

small colony to themselves, and their eggs, which are smaller than those of most terns, although large for the size of the bird, are laid in shallow hollows on the sandbank, usually at a part where there is some stunted vegetation. The normal clutch of eggs is two. These, like those of terns and skimmers, vary extraordinarily in colouring. The ground hue ranges from pale green to fawn, in some it is almost white. The spots are usually smaller—mostly tiny specks—than those of terns.

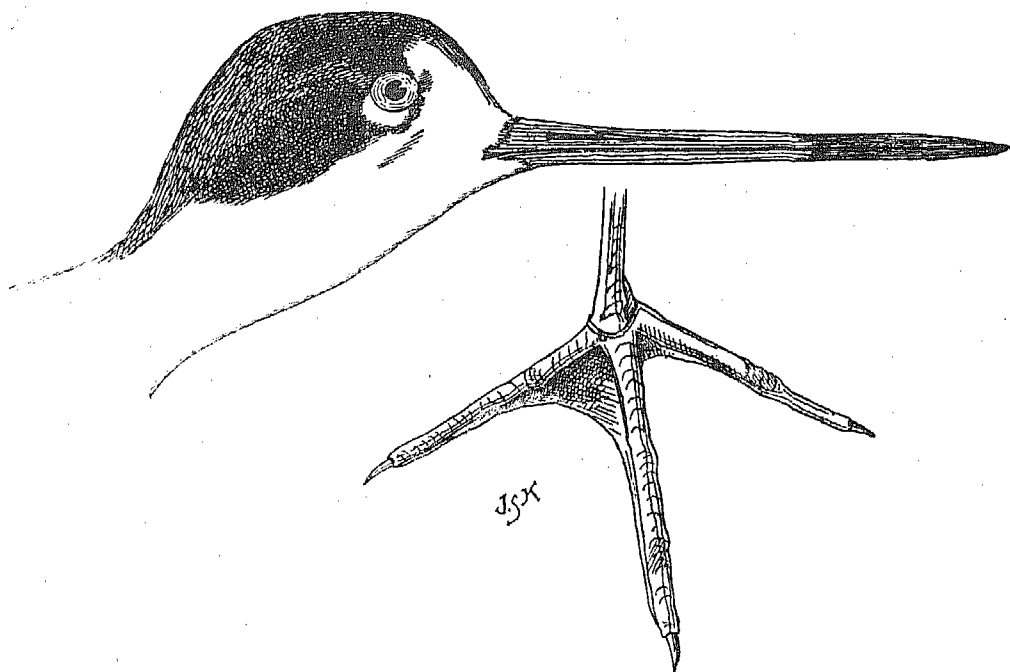
Baby swallow-plovers are much like baby terns, but the bill, which is broad at the base, and the legs are black. The down is fawn-coloured and the dark markings are less pronounced. The down has rather the appearance of the coat of a clouded leopard. When swallow-plovers have eggs, and these are approached, the parent birds simulate injury in the most wonderful way. One will fall, head over heels, and then lie still as if dead, a second will limp as though a leg were broken and another will flutter as if a wing were injured. But, as soon as the eggs are hatched and the young ones are running about, the parents make little fuss, even if the young birds be handled.

Gulls, terns, ducks, partridges and lapwings, when they have eggs, all behave more or less similarly. For reasons which I have set forth in *Glimpses of Indian Birds*, I do not believe that they consciously feign injury with the object of deceiving an intruder and enticing him away from their eggs. To believe this would be to allow birds reasoning powers, which they almost certainly do not possess. At the time when birds have eggs or young ones, the parental instinct shows itself with such intensity that it might well be described as fury. When such birds see their treasures threatened, they become temporarily demented with anguish and in consequence scream or lose control of their muscles. The casual observer who sees their behaviour in this connection says, "What cunning and clever creatures birds are!"

The stilt (*Himantopus candidus*) is a bird that is easily identified. The body is about the size of that of a dove; the legs, if not quite so long as Oxford St., are long enough to give the bird the appearance of being on stilts. They are bright red. The wings and back are black in the male and brown in the female; the rest of the body is white. The bill is long and straight. The stilt haunts shallow water. It lays three plover-like eggs in the sand.

The avocet (*Recurvirostra avocetta*) is a beautiful bird. The long bill is very thin and has a pronounced upward curve—just the opposite of that of the curlew. The body of the avocet is about the size of that of a pigeon. The plumage is white with black on the top of the head, the back of the neck, the shoulders and wings. The avocet has long legs, and, like the stilt, haunts shallow water, where it secures its food by sweeping the water horizontally with its bill. This bird was once served up to me in Bombay as snipe. All manner of

weird fowl do duty as snipe on Bombay tables. The avocet is only a winter visitor to India.



HEAD AND FOOT OF STILT.

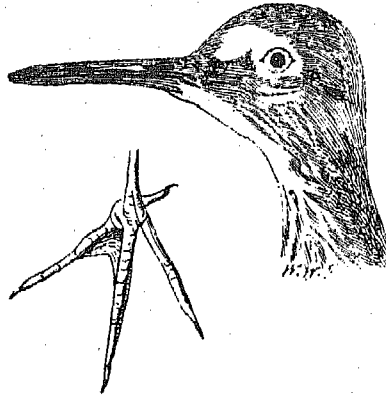
Now for the sandpipers. These birds are so called because they always live on damp soil, often sand, and have curious plaintive piping calls. Sandpipers feed on water insects, crustacea and molluscs; ergo, they spend their time on wet sand or in shallow water. The borders of every river and lake in India are the winter hunting ground of scores of sandpipers.

They have a snipe-like appearance and many of them are shot and eaten as snipe; for this reason the sportsman calls them snippets.

"The word 'snippet'" writes E. H. A., in *The Common Birds of Bombay*, "is not in the dictionary, but it is a word of very common use in India, as including any bird which purports to be a snipe and is not a snipe. There are many such, and since they are much easier to shoot than a real snipe, they find their way more readily to the market and to the tables of those who buy their game. The butler calls them 'ishnap' and he gives the same name to snipe, for he ignores the distinction." The butler goes further than this, he will serve up as snipe birds, such as avocets and did-he-do-its, which the newest griffen could not mistake for snipe. Hume, one of the greatest ornithologists who have lived in India, was dining out one day, when a dish of did-he-do-its was placed on the table. "Hallo" said Hume, "these

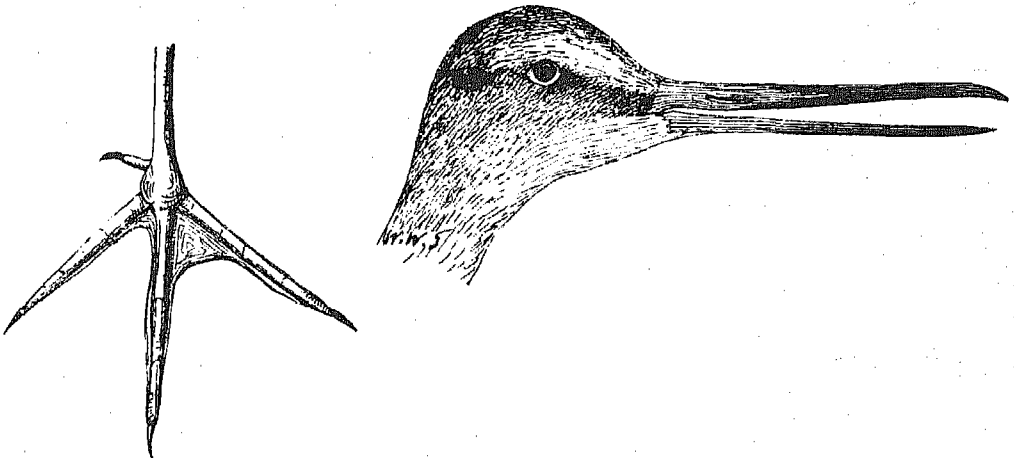
are not snipe!" "Oh, yes they are" said the host: then turning to the butler he asked: "Butler, what birds are these?" That worthy replied "Isnap, saheb." "There you are I told you so! *He knows!*" said the host triumphantly to Hume.

When writing about snipe in the earlier part of this work, I dilated upon the features whereby a snipe may be distinguished from



HEAD AND FOOT OF SANDPIPER.

a sandpiper. I will not repeat myself. It will suffice here to describe briefly the more common sandpipers. As there are some twenty different kinds, all more or less alike, I will not attempt to describe all.

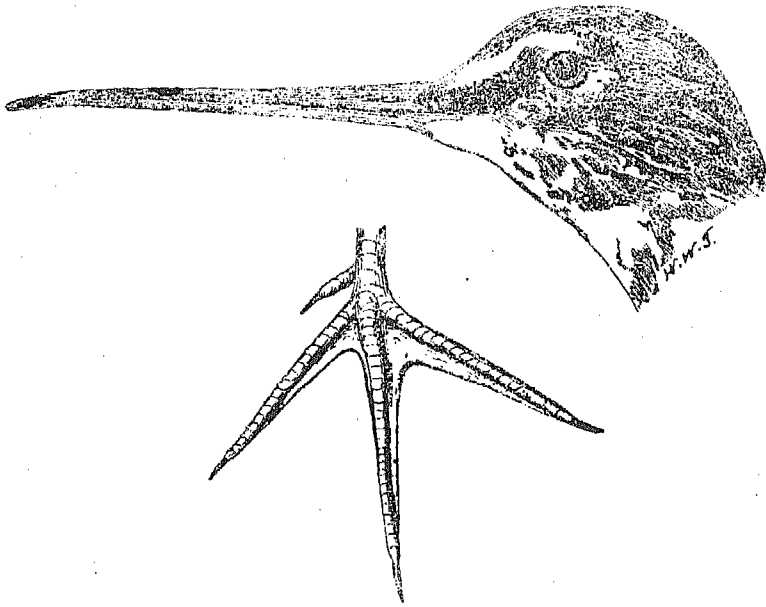


HEAD AND FOOT OF REDSHANK.

The common sandpiper (*Totanus hypoleucus*) is about the size of a myna, but it has only a rudimentary tail, which it wags with all the assiduity of a wagtail, as if, to impress upon the observer that it really

has a tail! It feeds on the mud on the margin of every tank, ditch, and river in India; when it is alarmed it flies away just over the surface of the water. It is a dull-looking bird. The upper parts are dark muddy brown tinted with olive; the lower parts are white. There is a narrow white *longitudinal* bar in the wing, visible only during flight. By this white bar you may recognise this bird at sight. It is very common in India in winter; much less so in summer.

The wood or spotted sandpiper (*Totanus glarcola*) has probably been innocently provocative of more bad language than has any other bird. The reason of this is that it keeps company with snipes. It is always getting up from the *jhil* quite close to the sportsman, who, before he has heard the shrill cry which it utters on the wing, mistakes



HEAD AND FOOT OF SPOTTED REDSHANK.

it for a snipe and takes aim at it; by the time he has discovered his mistake, he has probably missed the opportunity of an easy shot at some snipe that got up immediately after the sandpiper. Few there are who will not cordially endorse the mild remark of Mr. W. Jesse anent this sandpiper: "It is a perfect nuisance to the snipe-shooter." Those of us who have tasted the bird, will agree with Mr. Jesse, "it has a musky smell and is poor eating." The upper plumage is brown with dark spots; but the greater part of the lower back and tail is white. The white shows up when the bird is flying away from the sportsman. The amount of white showing in the plumage, as well as

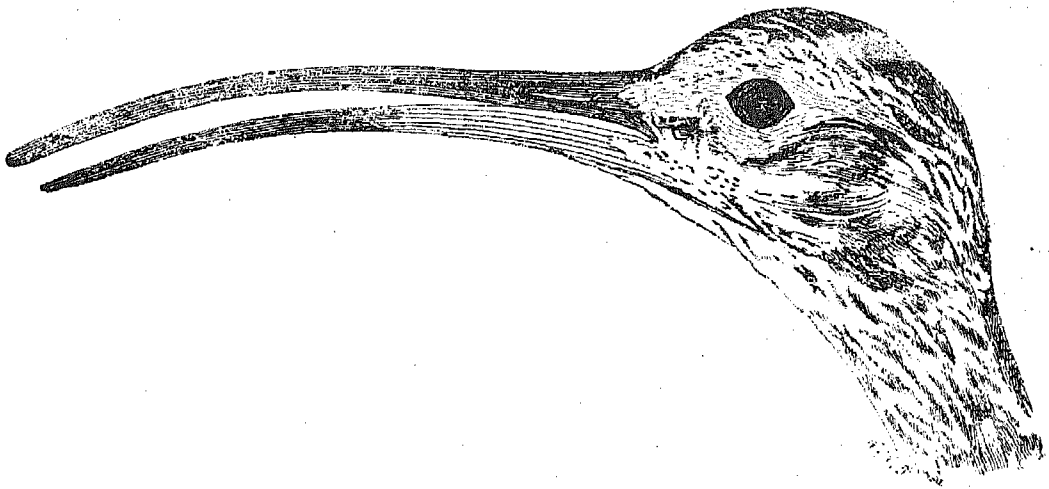
the un-snipe-like call are easy methods of distinguishing between this snippet and the snipe. Less common than the wood sandpiper and equally snipe-like in appearance are the redshank (*Totanus calidris*), the spotted redshank (*T. fuscus*), the greenshank (*T. glottis*) and the little greenshank (*T. stagnatilis*). As the English names imply, the two former have red and the latter green legs; by these and by their piping calls they may be distinguished from snipe as they rise from a *jhil*.

Before passing on to the godwits and the curlews, let me mention the little stint (*Tringa minuta*). "If," writes E. H. A., "you see a hundred dingy little birds, about the size of sparrows, all feeding together knee-deep in water, you may safely put them down as stints."

III.—Curlews, Whimbrels and Godwits.

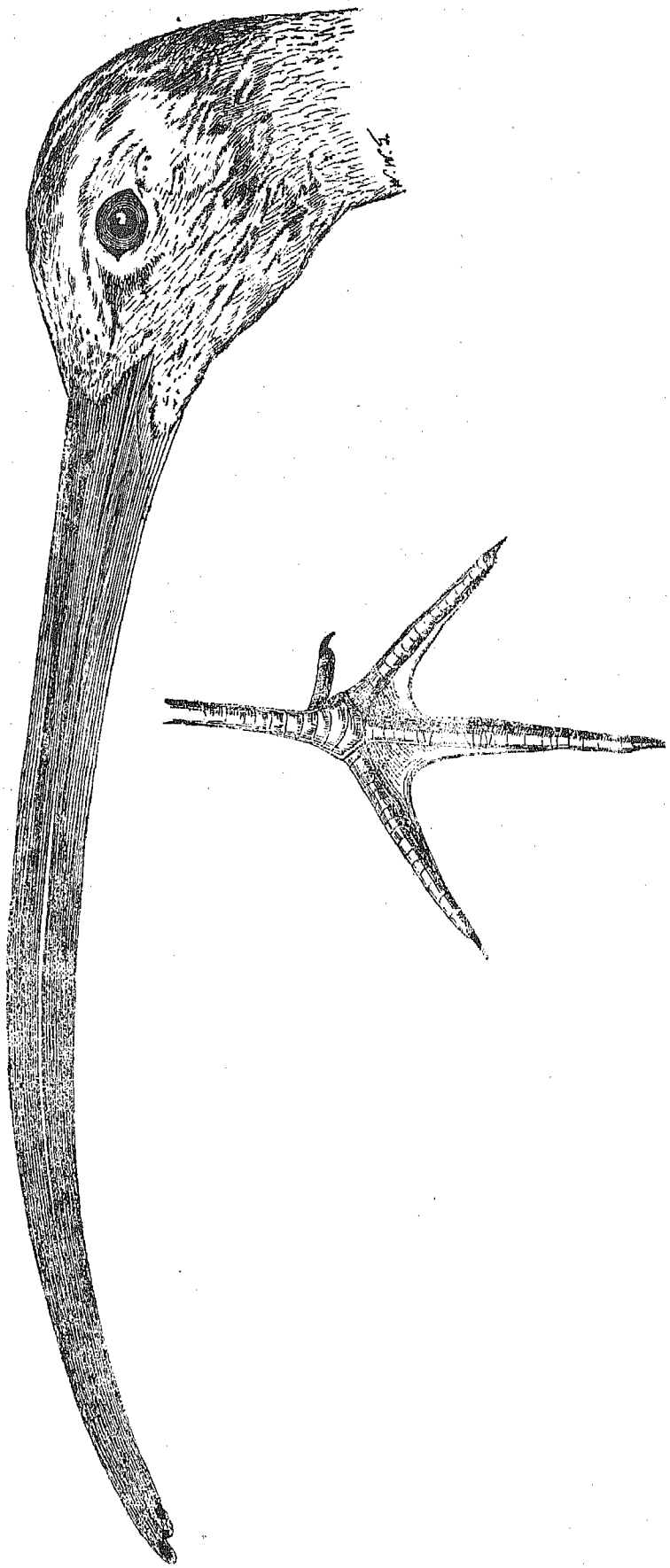
Curlews, whimbrels and godwits are large wading birds, so large that in England, where game is scarce and mostly accessible only to the wealthy, they are shot for sport. In India where wild fowl and game are plentiful and accessible to all, we despise the humble curlew and godwit and do not often shoot them.

The curlew (*Numenius arquata*) is about the size of a pheasant, but its length lies in the bill and not in the tail. The bill, which has a slight downward curve, is about 6 inches long, and is used as a forceps

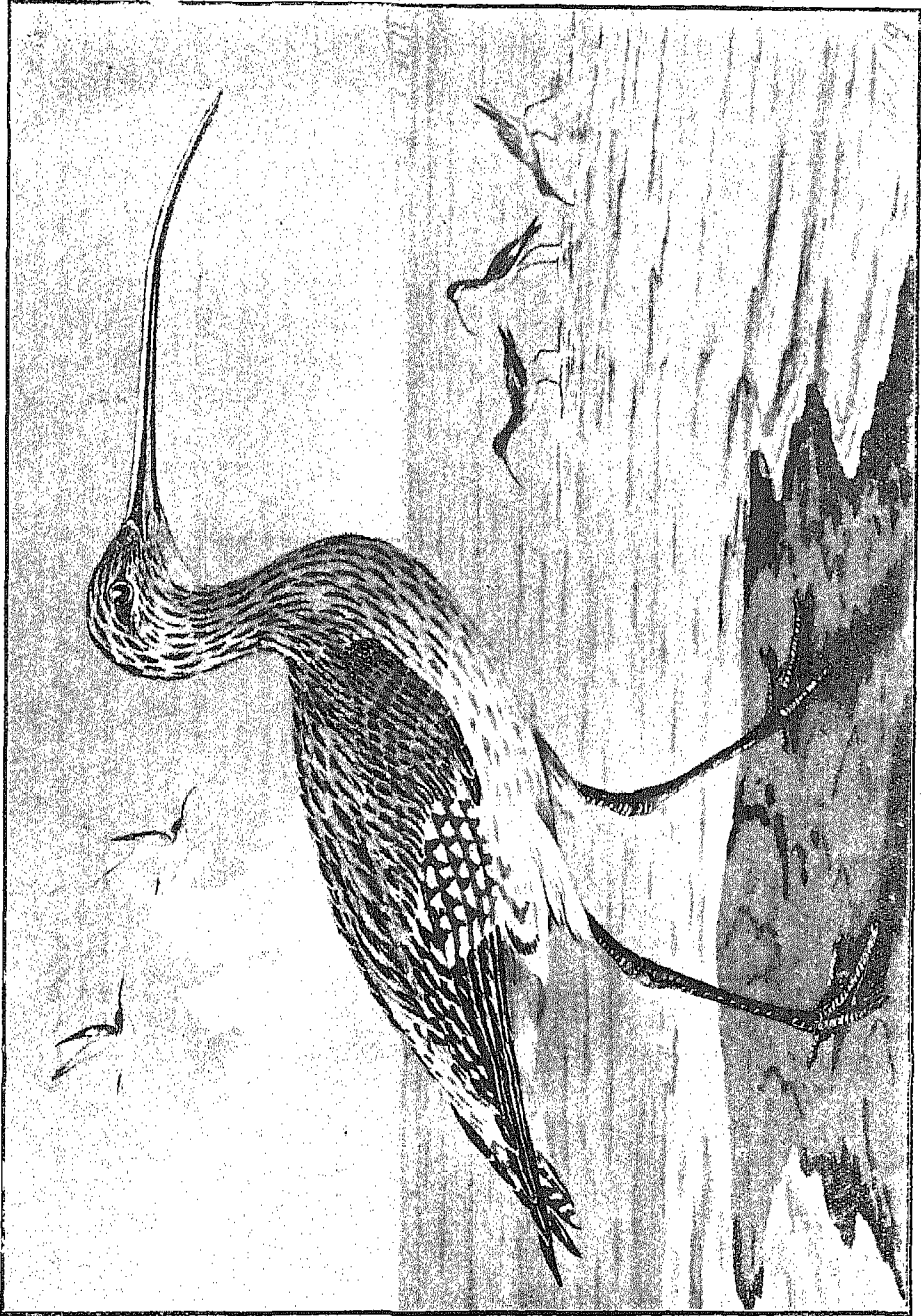


HEAD OF WHIMBREL.

for the extraction of crabs or shell-fish from their burrows in soft sand.



HEAD AND FOOT OF CURLEW.

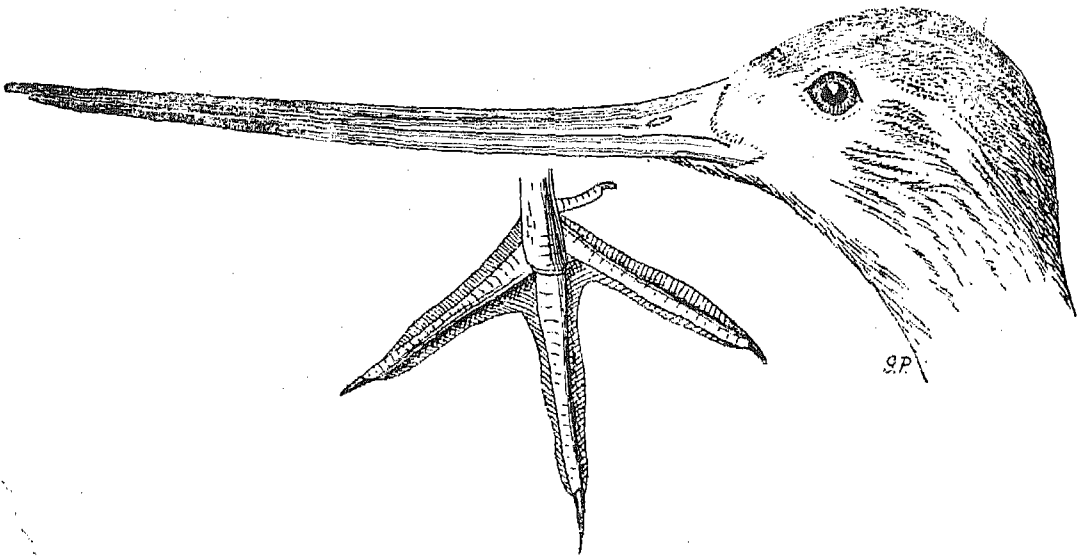


CURLEW (NUMENIUS ARQUATA).

From a distance the curlew appears to be a drab-coloured bird, and assimilates closely to the hue of the wet sand on which it seeks its food. Close inspection, however, shows that the brown feathers of the upper plumage have darker centres, giving the plumage a mottled appearance. There is some white just above the tail. The whole of the lower plumage except the foreneck is white.

The curlew is a winter visitor to India and is fairly common on our sea coasts and on the margins of the bigger rivers. Usually it occurs in singles or couples: occasionally a small flock is seen. It is a wary bird and, as it lives on open flats, it is difficult to approach. On the wing it utters a peculiar plaintive cry.

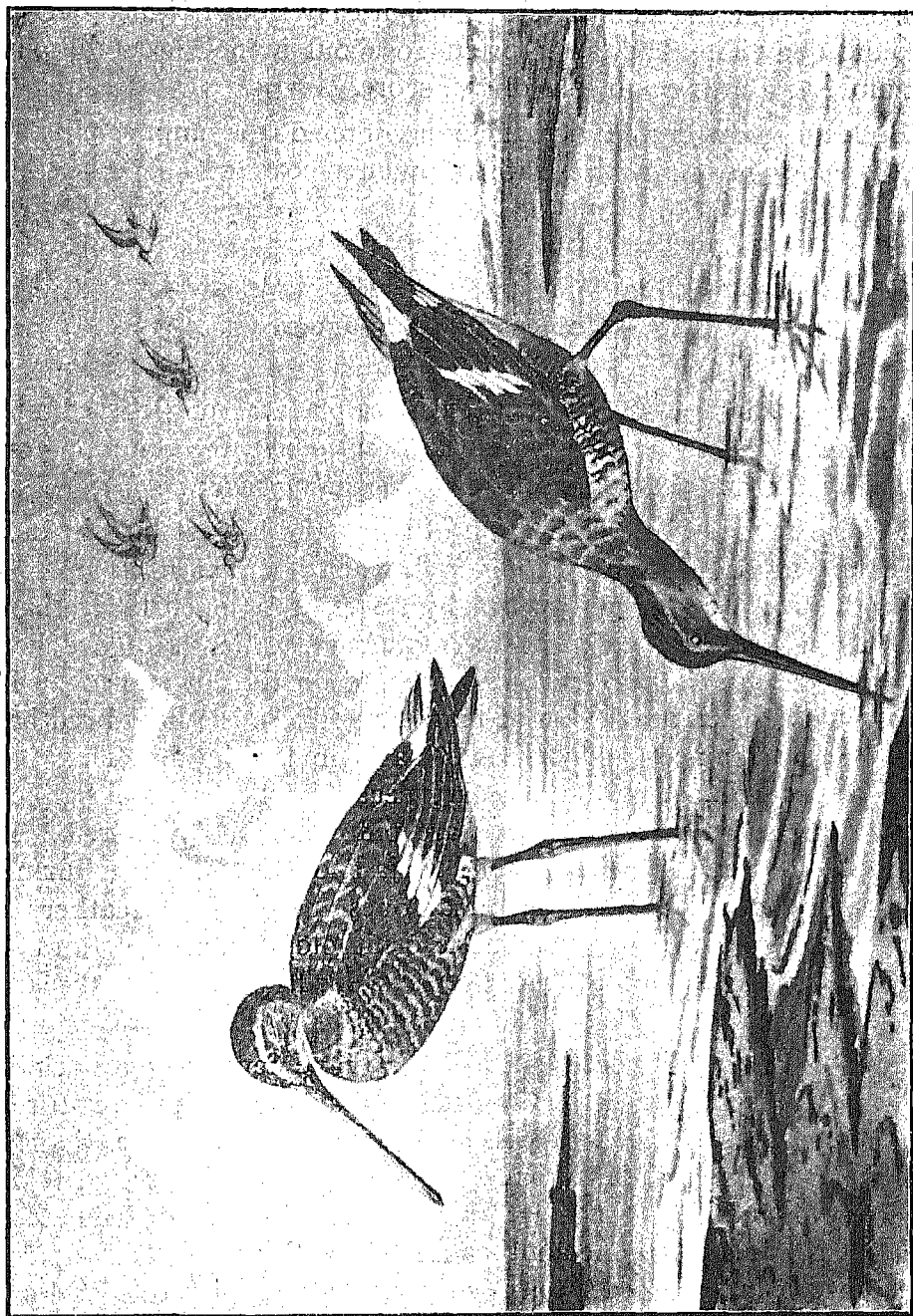
The whimbrel (*Numenius phaeopus*) is just a small edition of the curlew. The curlew is 23 inches long with a bill of 6, while the whimbrel is 17 with a bill of 3. The bill is less curved. Its colouring



HEAD AND FOOT OF BAR-TAILED GODWIT.

habits are like those of the curlew. It is a winter visitor to India, and comes in smaller numbers than the curlew. Both the curlew and the whimbrel are edible: but neither are good table birds. The flavour of the whimbrel is the superior. Large numbers of both kinds of birds are netted and sold in the markets of large Indian towns.

Godwits are snipe-like birds with long straight bills and long legs. They are much larger birds than the full snipe, the black-billed godwit (*Limosa belgica*) being about twice the size and the bar-tailed species



BLACK-TAILED GODWIT (*LIMOSA LIMOSA*). SUMMER PLUMAGE.

(*L. lapponica*) about half as big again. The bigger species, of which the bill is about 4 inches long, often passes for a woodcock in the Calcutta bazar! The large size, the white bar in the wing, the white base of the tail and the fact that the godwits feed in the open on the edges of tanks, swamps and rivers render it easy to distinguish between snipe and godwits. The latter often go about in flocks composed of any number of birds up to four or five score.

Both the godwits that visit India in winter don a summer plumage, which is ruddy in comparison with the winter coat.

IV.—Cranes and Flamingoes.

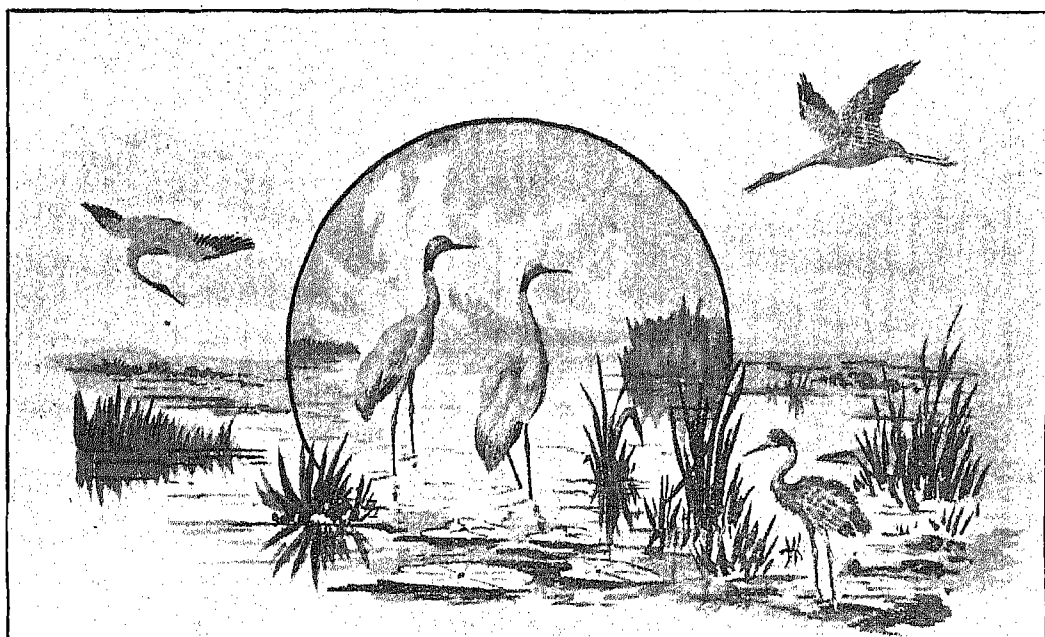
Three kinds of crane are entitled to a place among the common birds of India. These are the sarus (*Grus antigone*), the common crane (*G. communis*), and the demoiselle crane (*Anthropoides virgo*).

The sarus enjoys the distinction of being the largest bird in India. Its legs are more than a yard long, and, when it draws itself up to its full height like the heroine in a trashy novel, it is much taller than a man. The sexes are alike as to their plumage, which is of a delicate blue grey, pale in the tail and almost white on the lower neck. The upper head and neck are devoid of feathers. There is a broad red band running round the neck and the lower part of the head. This band becomes very brilliant at the breeding season, when it looks like a collar of crimson velvet. The legs are pink and the eye is red. The sarus is a common bird in Northern India and Burma. The Burmese birds are of darker hue than the Indian ones and the neck feathers are grey. This has given the systematic ornithologist an opportunity to make a new species out of the Burmese bird, which he calls *Grus sharpii*.

Saruses very rarely occur in flocks. I have never seen a flock, but I will not assert that flocks never occur, because such is the nature of birds that whenever I make a sweeping statement about one, that bird proceeds to put me in the wrong! All the saruses I have seen have been in pairs, with sometimes a young one. Indians firmly believe that a pair are so devoted to one another that if one be killed its companion mopes until it dies; in order to prevent this catastrophe, those who eat cranes always make a point of killing the pair. Saruses feed on vegetable matter, reptiles, insects, molluscs, frogs, and possibly, fish.

They are equally at home on bone-dry places and on damp low-lying ground. Their loud, harsh, trumpet-like call must be familiar to all who have lived in the *mofussil* of Northern India. The sounds they

make are of the kind to which distance leads enchantment. The sarus breeds in the rains. It has a small hind toe, apparently useless for grasping a perch, and in consequence it never perches on trees, and has, therefore, to build its nest on the ground. The nest is a considerable collection of grass, rushes and other kinds of vegetation; it is usually placed on a little knoll in a flooded field, or one of the circular mounds left in deep burrow-pits to assist in the measurement of the earthwork. Saruses seem very partial to burrow-pits near the permanent-way, and in the course of a journey by train during the monsoon you are likely to see several of their nests. The nest is usually about three feet in diameter. This fact alone would



SARUS (*GRUS ANTIGONE*) AND YOUNG.

suffice to dispose of the belief, which once prevailed, that long-legged birds like cranes and flamingoes, sit astride their nests, as a man or a modern young woman does a horse, and in this attitude incubate the eggs. Two large white eggs are laid, but more often than not only one hatches out. There is an entry in my natural history diary for September 30th, 1912, which gives a detailed account of a visit paid by me to a sarus's nest at Philibhit. This was written immediately after the visit, and so has the merit of being strictly accurate: "My *shikari*, whom I had sent out to find sarus's nests, brought me news of one about four miles off. I set out after cutchery was over and reached the spot about 5 p.m. The nest was placed in a small piece of water perhaps

forty feet square, with a millet field on one side, the railway on another, a road on the third, and rice fields on the fourth. The nest was only a few inches above the surface of the water; thirteen inches of rain fell the previous week, so there was plenty of water about. When we arrived the hen was sitting on the nest and the cock strutting about a little distance away. As I approached (on horseback), the hen rose slowly and stood on the nest, and then I could see that there was a young one. This was about the size of a bazar fowl. As I got nearer, the mother started apparently scraping at the nest with her feet and the nestling took quietly to the water and swam slowly to some paddy. Meanwhile the hen bird descended from the nest in a leisurely manner and quietly walked off. Although the cock came slowly towards me I did not anticipate any trouble. The birds seemed to be taking my visit very calmly. When I reached the nest I found that it was composed chiefly of rushes with some stout pieces of stick. It contained one egg. I told the *shikari*, who was wading, to catch the young bird which he did without difficulty; it did not seem to object in the least to being handled. The parent birds were also standing looking on calmly at a distance of twenty or twenty-five feet. The youngster was in down plumage. The upper parts were a rich ruddy fawn colour, darkest along the spine and the lines of the wing bones, where the colour was almost deep enough to be called chestnut. From these dark parts it gradually faded until it merged into the yellow cream of the lower parts. The eyes were large and black, the bill was pink at the base, becoming paler towards the tip which was almost white. The legs and feet were pale pink, the latter being slightly webbed. The legs were long in comparison with the size of the body, and were so weak that they could barely support the owner. I then examined the egg. It was cracked and a young one was about to emerge, and I thought I heard it "cheeping," but could not be quite sure as my horse was a bit restive,—he was standing in $2\frac{1}{2}$ feet of water and kept swishing his tail and splashing the water with it. Suddenly the cock sarus decided to attack us. He bent his neck, half opened his bill, expanded his wings, and slowly advanced in a rather roundabout way. When he was within about six feet of me I made a pretence of striking him with my fly whisk—he was of course out of range. This had no effect, and he continued to advance slowly. Whereupon one of the men with me threw some rice stalks at him. That made him hop and he retreated a pace or two, only to return to the attack with renewed vigour. Then one of the men rushed at him, and he retreated a few paces, hastily but with dignity. Next he began to make circles round us, with neck and shoulders bent, like the villain in a melodrama. When he got within four feet of the *shikari* and made as if to spring at him, the *shikari* struck at him with a short stick.

Mr. Sarus dodged the blow and went back a pace or two. This comedy lasted about ten minutes. The hen kept all the while at a distance of some thirty yards—an interested spectator. Only once did the cock utter his trumpet-like call. When we had seen all we wanted and I had satisfied myself that the young bird is not protectively coloured, we replaced him in the nest together with the egg, and then departed to a distance of fifteen yards to see how the parents would behave, the *shikari* calling out to them *apne bache ko jao!* They approached the nest slowly, the cock leading. He was easily distinguishable by his larger size. When he had arrived within about ten yards of the nest he slowly drew himself up to his full height and stood thus motionless for a few seconds, then he pointed his bill to the sky, next the long neck bent itself into a regular S. While the neck was thus bent he dipped his bill into the water, and then became erect and repeated the performance. After this he danced a little dance. Then again he stood motionless. Meanwhile the hen returned to the nest, got up on to it and began probing about in it with her bill, apparently to ascertain whether any damage had been done."

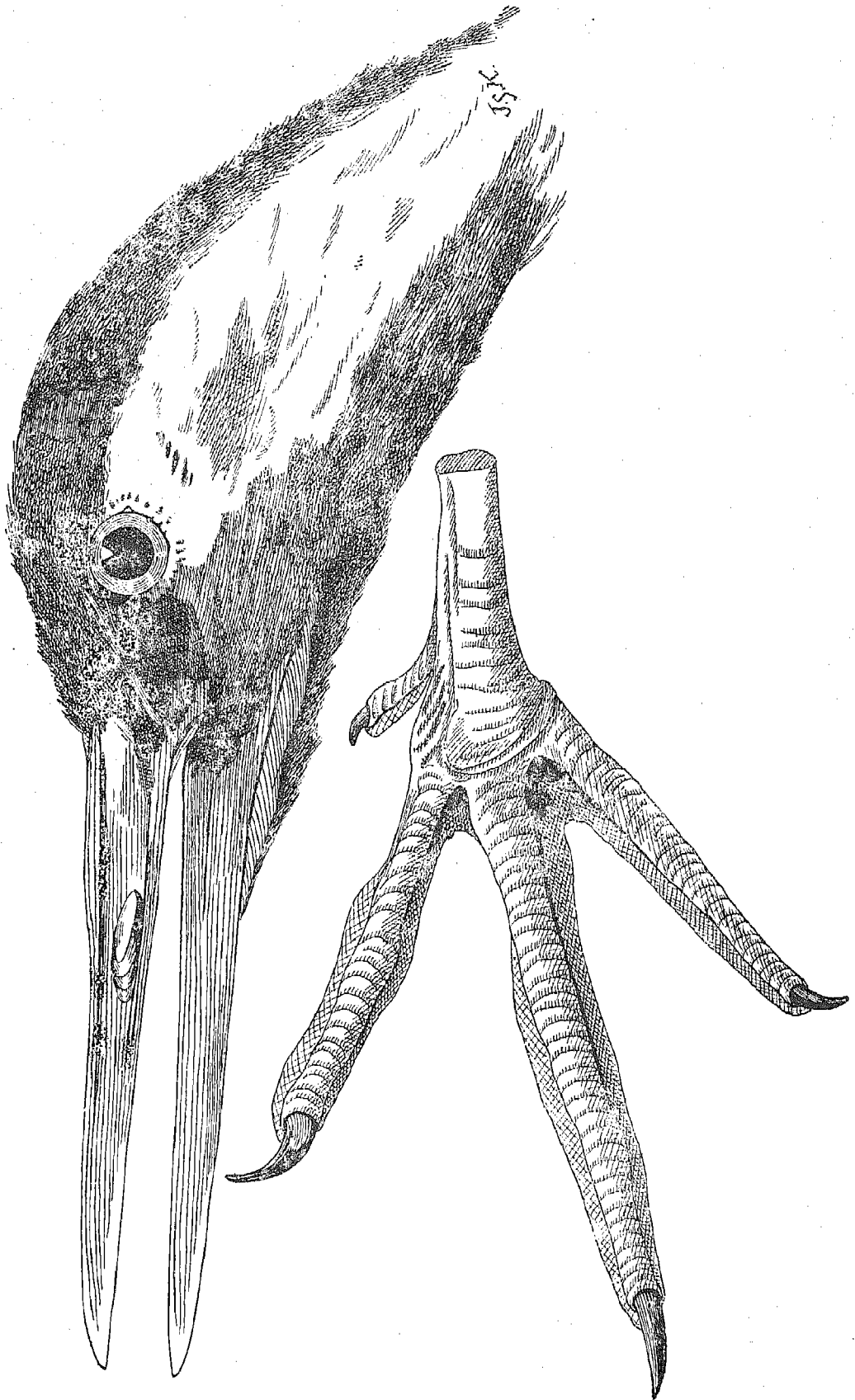
The common crane, which is often called the *kullan*, is a winter visitor to Northern India. Although a large bird it is considerably smaller than the sarus. The plumage is ashy grey; the head is devoid of feathers and has a bright red band across the top. The legs and feet are dark brown.

Cranes, like storks, fly with their long necks extended and so can be distinguished, at a glance, from the herons and paddy-birds which fly with the head sunk into the shoulders, which causes the neck to project like that of a pouter pigeon.

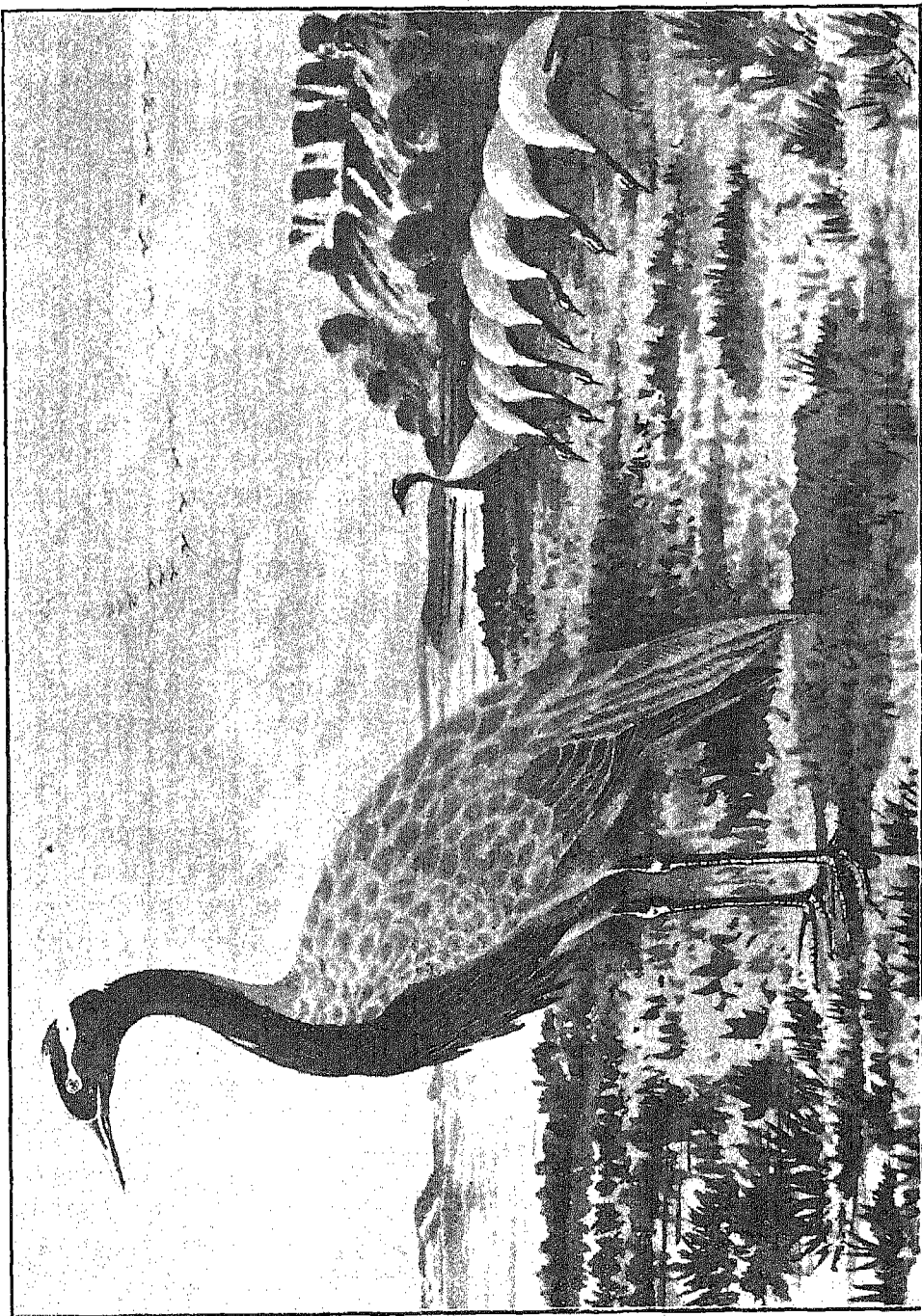
A characteristic of this and some other species of crane is that the webs of some of the wing feathers are free, like those of ostrich feathers. These wing feathers are so long that they project beyond the tail, which is short, and give the bird the appearance of having a bushy tail. Common cranes go about in flocks. They feed in the morning and evening, chiefly on grain, and do considerable damage to the crops. Having had their morning meal they betake themselves to the border of a river or tank, where they spend the day. Before sunset they return to their feeding grounds, and after supper roost on the ground in the locality at which they spent the day.

A flight of them often assumes the shape of a very open V. When on the wing they utter their clarion call which is so loud as to be audible to a person on the ground when the birds appear as mere specks overhead.

The demoiselle crane or *karkarra* is the smallest of the family and is not much more than half the size of the sarus. The head and



HEAD AND FOOT OF CRANE.



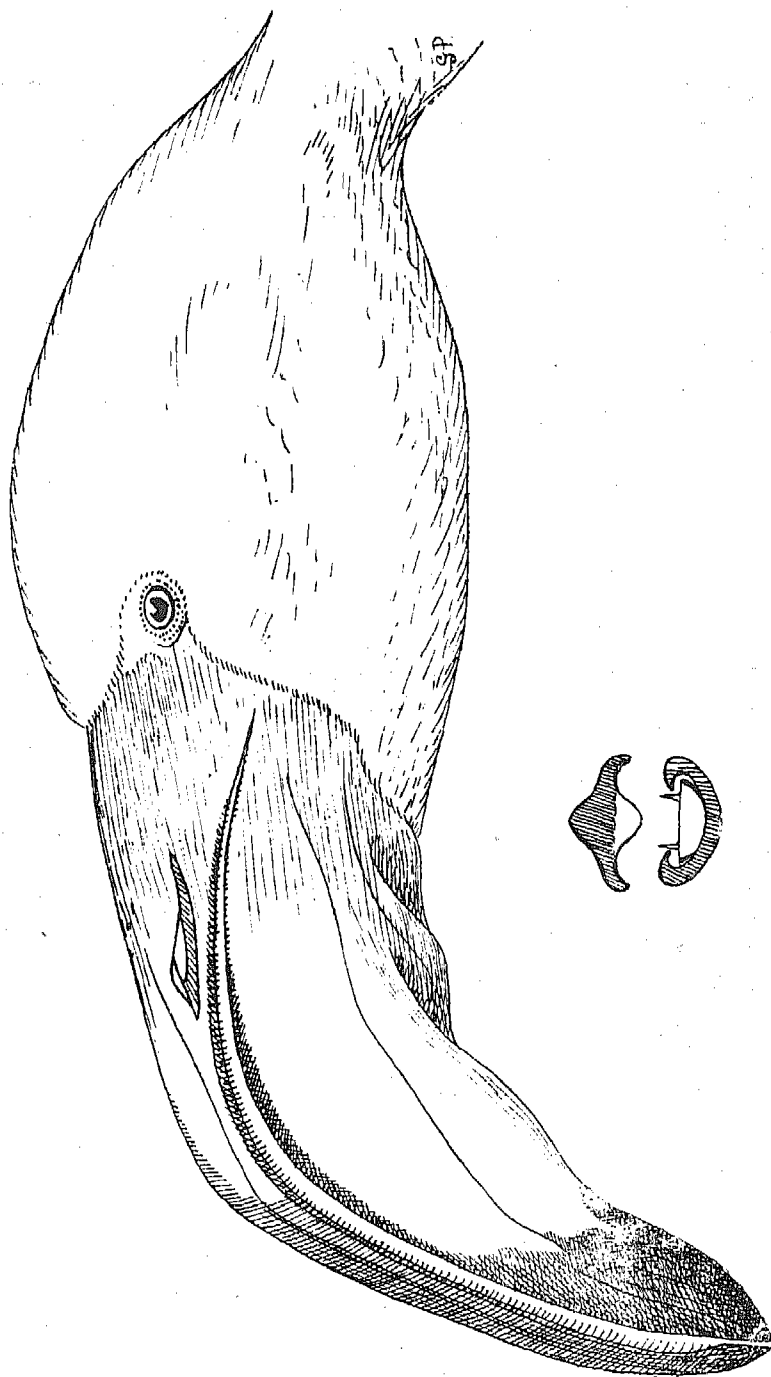
(ANTHROPOIDES VIRGO.) THE DEMOISELLE CRANE.

neck of this handsome bird are black, set off by red eyes, a grey cap, and white plumes which project from behind the eye. The wings are grey and black, the elongated wing feathers are stiffer and straighter than those of the common crane. Demoiselles usually occur in large flocks. The call is harsh, the name *karkarra* is undoubtedly onomatopoeic. Demoiselle cranes feed largely on the safflower seed. Their habits are much the same as those of the common crane.

I might have dealt with flamingoes in Number I of this series, because their front toes are fully webbed and they are good swimmers. When they swim they carry the stern high, after the manner of geese, and the neck curved. As, however, flamingoes are essentially waders, I prefer to class them with cranes. In truth, flamingoes are aberrant birds, which have puzzled naturalists. Some consider them crane-like ducks and others duck-like cranes. Jerdon and Stuart Baker class them with geese and Indians call them king geese (*Raj hans*). I have not had many opportunities of watching flamingoes in the wild state, but wherever I have seen them, it has been in shallow water, where there was no need for them to swim, but the soft ooze on which they walked rendered the webbed feet very useful supports.

Two species of flamingo occur in India, the common (*Phœnicoptrus roseus*) and the smaller (*P. minor*). The former is the more abundant. It is nearly as tall as a man, and measures over four feet from the tip of the bill to the end of the tail, the body is small and the neck and legs seem disproportionately long. The general hue of the bird's body is white, washed with pink. The wings are crimson and black. When a flock rises, the crimson-and-black wings open out and the flock looks as though a red light had suddenly been thrown upon it. The bill is pale pink, tipped with black. The legs are deep pink. During flight the neck and legs project stiffly, forming one continuous line broken by the crimson wings.

The neck is extraordinarily supple. The bill is a remarkable structure. It is bent almost to a right-angle in the middle, so that when the basal portion is horizontal the tip points towards the ground. When the bird feeds, the top of the head almost touches the ground, the tip of the bill points towards the bird's toes, and the upper mandible, which is flattened and smaller than the lower one, rests on the ground. The lower mandible, which is uppermost when the bird is feeding, is arched like the upper mandible, in most birds. The food, which consists of small crustaceans, molluscs, insects and vegetable matter, is scooped out of mud or slime. The mandibles are lamellated like those of a duck and act as sieves through which the fleshy tongue forces out the slime taken into the mouth, the edible matter alone being retained.



HEAD AND SECTION OF BILL OF FLAMINGO.

The nest of the flamingo is a mound raised above the water. The only place where they are known to breed in India is the Runn of Cutch. Dean Stanley gives a picture of a flamingo sitting astride on its nest. This, of course, is not accurate; the bird incubates with its long legs folded under the body. Two naturalists claim to be the first to have discovered this fact, and so keenly did each urge his claim that a law suit ensued, to the great astonishment of the learned judge, who could not be made to see the immense importance of the position of the legs of a flamingo when incubating the eggs! The only parts of India in which the flamingo is common are Sind, the backwaters of Madras, and parts of Guzerat, Rajputana, the Punjab and the U. P. Bengalis, however, have a good opportunity of observing these beautiful birds when the ship which bears them homewards is passing through the Suez Canal. The lagoons on either side of this are the resort of many flamingoes.

THE PERCHING WADERS.

I.—Storks.

We have now considered all the common wading birds which, having no hind toe, or only a poorly developed one, cannot perch in trees, excluding snipe and a few other birds which come under the category of the game birds, and which I, therefore, at the risk of incurring the wrath of the systematic ornithologist, decline to herd with the non-sporting birds. We must now give the perching waders an innings. There are a good many of these numbered among the common birds of India. They fall into three classes—the storks, the ibises, and the herons. All have a well-developed hind toe; this serves a bird in much the same way as the thumb does a man.

Now, the unfortunate birds that are not able to perch have to nest on the ground—a very dangerous place. In order to give the youngsters a chance of surviving—and the chance is not a good one—they are endowed with the power of running about the moment they leave the egg. Most birds that can perch know better than to lay their eggs on the ground. To the young of such it is a positive disadvantage to be able to run about directly they leave the egg; were they able to do this, most of them would run out of the nest and fall to the ground. This is why birds that are born in lofty nests are not able to run about when they are hatched. They remain safely in the nest until their wings are sufficiently developed to enable them to fly. With this preamble let me introduce the storks to you.

The chief features of a stork are its long legs, well-developed hind toe, long wings and short tail. The bill is stout and long. Most storks have no voice; when they want to make a joyful noise they have to snap the beak. There are eight kinds of storks in India, most of which are probably entitled to be numbered among the common birds. The first of these is known as the white stork (*Ciconia alba*). He is a white bird with some black in the wing, having bright red bill and legs. When describing storks the pronoun 'he' includes the ladies, for they are dressed just like the men.

Stork, number two, is called the black stork (*C. nigra*). He is a black bird glossed with green, but the lower parts from the middle of the breast downwards are white. The bill and legs are red.

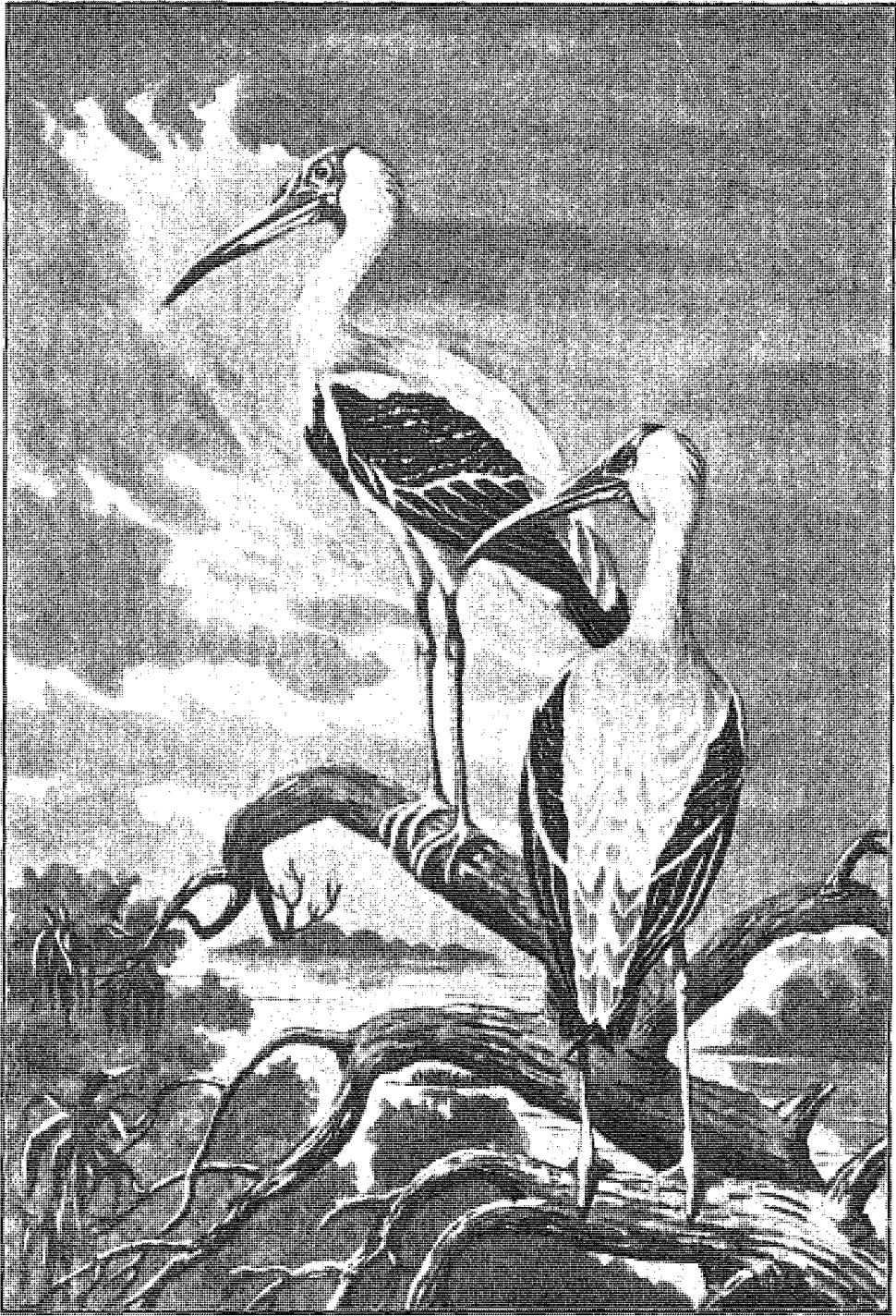
Number three is the white-necked stork (*Dissura episcopus*). This is a black bird glossed with green, but the neck, lower parts and tail are white. The bill is black and the legs red.

Number four is the black-necked stork (*Xenorhynchus asiaticus*). This bird is white except for the bill, head, neck, shoulders, tail and the greater part of the wings which are black. The legs are red.

Number five has rather an out-at-heels appearance. It is known as the openbill (*Anastomus oscitans*). Jerdon called this the shell-ibis. He might almost as well have called it the Grandfather's Clock! At all seasons of the year, excepting during the rains when it breeds, this bird looks like a white stork—sadly in need of a wash—which has damaged its bill through trying to crack nuts with it! In the breeding season the smoky grey of the plumage is replaced by white, but the gap between the upper and lower mandibles remains, so that you may easily distinguish it from the white stork. Again, at all seasons the bill and legs, instead of being bright red like those of the white stork, are of a dull, greenish hue, more or less tinted with red. Another feature which distinguishes it from the white stork is the fact that the face is devoid of feathers.

The painted stork (*Pseudotantalus leucocephalus*) or pelican-ibis as Jerdon called it, is not so common as the five storks already mentioned. Its prevailing hue is white, but there is some pink and a good deal of black in the wings; the tail is black. Then there is across the lower breast a broad black band glossed with green. The bill, which is slightly curved downwards, and the face, which is devoid of feathers, are orange yellow; the legs are pink.

Lastly, there are the clowns of the bird world, the two adjutants—the adjutant (*Leptoptilus dubius*) and the lesser adjutant (*L. javanicus*). These are bigger than the other storks, which are about a yard long, except the black-necked stork, which is over four feet in length. The adjutant is five feet long and the lesser adjutant four-and-a-half. The bill of the larger species of adjutant is more than a foot in length, broad at the base and tapering to a point, its colour is dirty green. The only feathers on the head and neck are a few hair-like ones which remind one of the hairs on an elephant's head. The bare skin is blackish on the forehead, saffron-yellow on the upper neck and brick-red lower down. At the base of the neck is a ruff of white feathers of the kind seen in ladies' boas offered for sale in Bow Road. This ruff is of course quite out of keeping with the bare neck, and intensifies the grotesqueness of the bird. It fails to conceal the pouch which hangs from the throat. This pouch is over a foot in length and causes the bird to look as though it were suffering from goitre. A good account of this bird is contained in Cunningham's *Some Indian Friends and Acquaintances*. Writes Cunningham: "Even the splendid gamboge, orange and vermilion hues that paint the distended pouch as it hangs down in front of the chest, in place of redeeming the hideous and almost indecent character of the appendage, only



THE PAINTED STORK (*PSEUDOTANTALUS LEUCOCEPHALUS*). $\frac{1}{8}$ natural size.

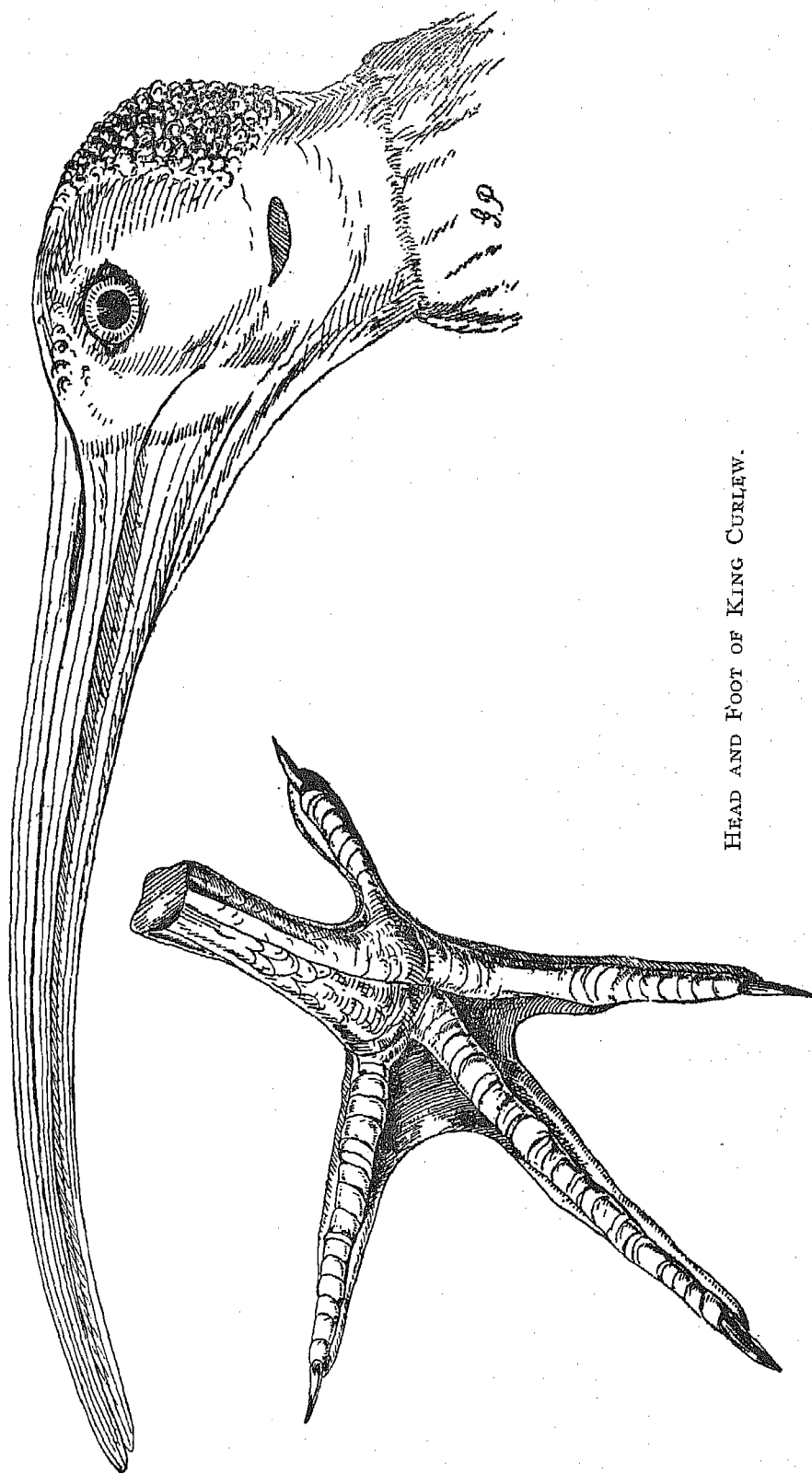
serve to accentuate the horror by attracting attention to its presence." It is not known of what use this pouch is to the adjutant. The lesser species gets through life quite comfortably without it. The eye is white and very small and gives the bird a malignant look. The back and wings are dark-grey, becoming tinged with blue at the breeding season. Seen from behind, the adjutant looks like a short, hunch-backed, old man with very thin legs, who is wearing a dark-grey swallow-tailed coat. If the adjutant presents a comic appearance as it stands, what shall I say of it when it walks? A man who could successfully mimic the adjutant's movements would be a dangerous rival to Charlie Chaplin as a cinema star!

The adjutant was formerly a common bird in Calcutta, and was a great source of amusement to soldiers in the Fort. The adjutants used to leave the town in the winter and return at the beginning of the rains. The cause of the disappearance of the adjutants from Calcutta is sanitary improvement which has greatly diminished the supply of offal to be found in the streets of the City of Palaces.

The lesser adjutant has the upper plumage, wings and tail black, glossed with green; this, together with the absence of the gular pouch, renders it easy to distinguish from the larger species. It does not feed on carrion as the larger bird does, but, like other storks, on fish, reptiles, frogs, crabs and molluscs. Adjutants construct huge nests in trees—platforms nearly six feet in length.

II.—Ibises.

We now come to the ibises. An ibis is a bird from two to two-and-a-half feet in length, having a long bill with a downward curve like that of a curlew. Three species are numbered among the common birds of India: the white ibis (*Ibis melanocephala*), the black ibis (*Inocetus papillosus*), and the glossy ibis (*Plegadis falcinellus*).¹ The white ibis is easy to identify. It is the size of a good, large English fowl. Its plumage is white. There are no feathers on the head and neck, of which the skin is black; the legs are black. The black ibis, which is sometimes called the king ibis or the king curlew, is also bald as to the head, which is black with a crop of red pimples on the top and back thereof. The legs are red, as are the eyes. The plumage looks black from a distance, but closer inspection shows the shoulders to be dark brown and the wings and tail glossy, dark purple-green. There is a white patch on each shoulder. This bird is about the same size as the white ibis. The glossy ibis has brown legs and eyes. The head and neck, which are feathered, except the part of the head round and in front of the eyes, are black streaked with white. The back, breast and abdomen are of a chestnut hue; the wings and tail are dark brown glossed with green or blue. This ibis is a



HEAD AND FOOT OF KING CURLEW.

little smaller than the others, being about two feet in length, of which the bill accounts for nearly six inches. This bird is not so common as the other two. In most parts of India it is a winter visitor only. This species and the white ibis frequent tanks, marshes, paddy fields, the borders of rivers and the sea shore. They generally occur in small flocks. The black ibis, on the other hand, is usually found on dry land in pairs, sometimes in small parties. Ibises breed in the rains, building nests of sticks on trees.

The spoonbill (*Platalea leucordia*) is a large ibis—nearly a yard long—of which the beak has been flattened, so that it has considerable breadth but no depth. At the tip it is much broader than at the base. Indeed it is, as the popular name implies, like a flat spoon of which the handle is inserted in the bird's head. The plumage is white, the long legs and the bill, which is eight inches in length, are black. There is a bare patch of yellow skin on the throat and the front of the head. Spoonbills are said to be good eating. They go about in small flocks and spend most of their time on the edges of large rivers and in marshes and tanks. The habits of the spoonbill are similar to those of the ibises.

III.—Hérons.

We have now to consider the herons. As Finn remarks: "Few birds are more recognizable at sight than a heron, although it may be as small as a myna or as big as a stork." All the long-legged birds hitherto described—the cranes, storks and flamingoes, etc., except the adjutants—fly with the neck and legs stretched out stiffly, so that when in the air each looks like a pole on wings. The herons likewise fly with the long legs projecting stiffly beyond the tail, but they carry the head buried in the shoulders, so that the neck projects like the throat of a fantail pigeon. Thus, when you see a long-legged bird flying with the head buried in the shoulders you may at once set it down as a heron or an adjutant. The latter can be easily distinguished by its large size and massive beak. The bill of the heron, although long, is slender and stiletto-like. A feature of the middle claw of the heron is that it is furnished with a comb by means of which the bird performs its toilet.

The common heron (*Ardea cinerea*), which Jerdon called the blue heron and which, in my opinion, might more appropriately be named the grey heron, is the species found in England. Before the Fens were drained this bird used to be abundant and was the favourite quarry of the falconer. It is over three feet in length. The general hue of its plumage is French grey. The head, neck and lower parts are mainly white. There are black streaks on the side of the face and in front of

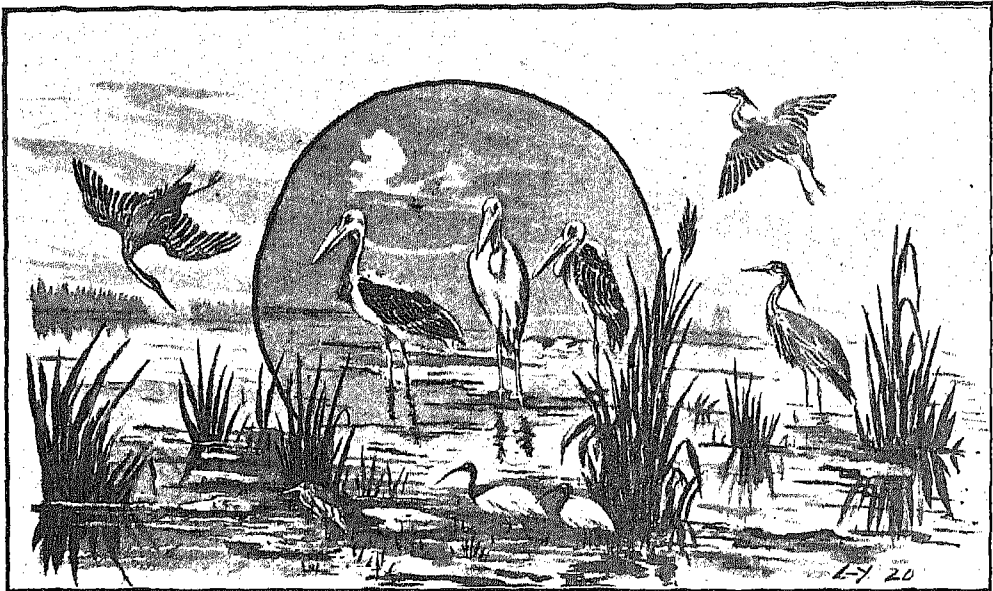


NIGHT HERON (NYCTICORAX GRISEUS.)

the neck. The large wing feathers have black edges; there is a long, rather scanty, pendant crest which is black. The bill is dirty yellow, the eyes are bright yellow, and the long legs greenish yellow.

The eastern purple heron (*Ardea manillensis*) is about the same size as the common heron. It requires an ornithological imagination, which is only a little less vivid than that of an astronomer, to call this bird purple. There is no purple in the plumage. This species is readily distinguished from the common heron by its dark, slaty-grey body plumage. The neck is the colour of rust, except there is a broad longitudinal stripe of black running along the back thereof and a narrow one on each side. There is some chestnut in the wings.

The pond heron (*Ardeola grayii*), more commonly known as the paddy bird, is one of the lesser members of the heron tribe, being about



ADJUTANT STORKS (*LEPTOPTILUS DUBIUS*), in centre.
 EASTERN PURPLE HERON (*ARDEA MANILLENSIS*), on right.
 BLUE HERONS (*ARDEA CINEREA*), flying.
 POND HERON (*ARDEOLA GRAYII*), standing left.
 WHITE IBIS (*IBIS MELANOCEPHALA*), below Adjutant.

the size of a house-crow. It is the ubiquitous bird found on every piece of water in India, from the smallest village pond to the biggest *jhil* and river, and it sits all brown and flies all white. The prevailing hue of the head, neck, back and shoulders is that of mud; the feathers of the head and neck are streaked with buff. The wing feathers are white but these are completely hidden by the mud-coloured wing coverts when the bird is not actually flying.

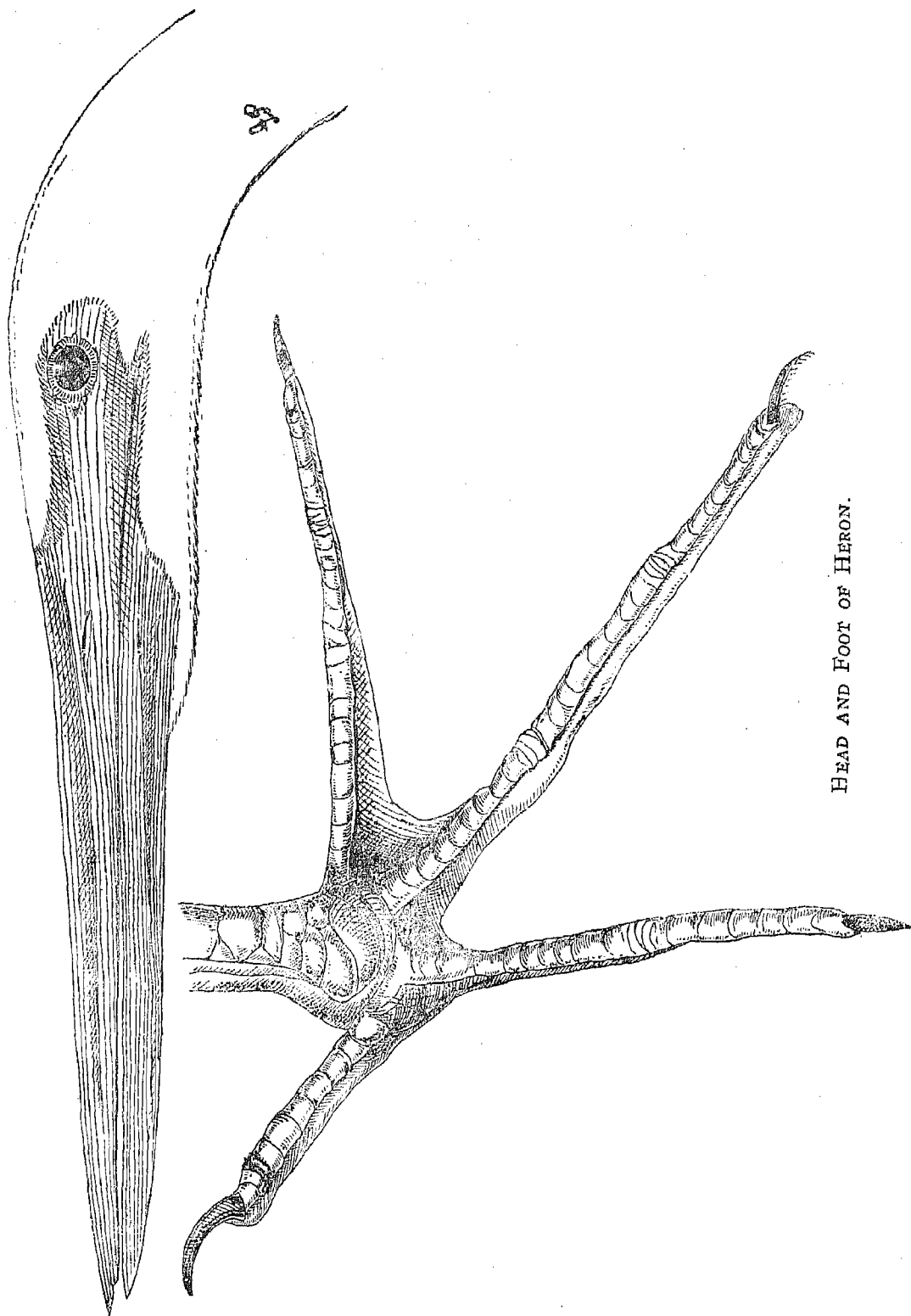
The three herons described above feed by day. Their habit is to stand in shallow water, perfectly motionless with the head drawn in to the shoulders and the fierce-looking yellow eye fixed on the water.

Presently a frog or some other aquatic creature comes along, then the telescopic neck shoots out and the quarry is seized and swallowed at a gulp. This is how the solitary herons feed.

Before describing the egrets or sociable herons, two more solitary herons must be noticed. These differ from those mentioned above, in that they are nocturnal or crepuscular in their habits. They lie up in trees or among rushes all day long; when the shades of night begin to steal over the land, they come forth and proceed to fish. The first of these is the night heron (*Nycticorax griseus*). When sitting on the *chabutra* after sunset most people have probably heard overhead a harsh *waak*. This is the call the night heron utters when on the wing. On looking up to discover whence the sound comes you see, perhaps one bird, perhaps a string of birds each about two feet in length, and which in the gloaming may be mistaken for flying foxes. These are night herons on the way from the tree in which they have spent the day to their feeding waters. The only piece of bright colour about the night heron is the red eye. The head, back and shoulders are black, glossed with green. As in the common heron there is a thin black recumbent crest. The rest of the upper plumage is ashy grey, while the forehead, cheeks and lower parts are white. From the nape grow two or three narrow white feathers of great length.

The little green heron (*Butorides javanica*) is about the size of the paddy bird. During the greater part of the day it hides in trees or rushes but is less nocturnal than the night heron, and often comes forth to fish just before sunset, and then you are able to make out by the help of field-glasses what a pretty little heron this is. The forehead, crown, down to the eyes, and a long pendant crest are black, glossed with dark-green. There is a short black line running back from the gape below the eye. The chin and throat are white, as is a streak on the ashy cheeks. The abdomen is chocolate brown, and the rest of the lower parts dull red. The wings and the rest of the plumage are various shades of green, streaked with grey and buff.

So much for the herons, great and small, that seek their quarry in isolation. Let us now consider the egrets which hunt in company. There are several species of egret found in India. These vary in size from that of the common heron to that of the paddy bird. They are all clad in snow-white plumage, and develop at the breeding season dorsal plumes which are highly prized as ornaments and form the aigrettes which are worn in hats and which for some unknown reason are called "ospreys" by merchants who deal in birds' plumage. Four species of egret are numbered among the common birds of India; these are the large egret (*Herodias alba*), the smaller egret (*H. intermedia*), the little egret (*H. garsetta*) and the cattle egret (*Bubulcus coromandus*).



HEAD AND FOOT OF HERON.

These have been set forth in order of their size. They are all pure white birds, in consequence it is not an easy matter to distinguish one from the other. In the cattle egret the bill is yellow at all seasons. In the little egret it is black at all seasons. In the two bigger species the bill is black in the breeding season, that is to say in the rains, and yellow at other times.

In the herons there is little, if any, difference between the plumage of the male and female. In the breeding season in some species both sexes assume special plumes. Thus, in the case of the paddy bird the back and shoulders become maroon coloured and two or three long white hair-like feathers grow from the back of the head. These are shed after the breeding season. In case of the large egret a train of long ornamental feathers springs from the upper back; the feathers which constitute this are termed, in scientific parlance, decomposed, that is to say that there is a space between each barb, so that each feather forms a spray. These plumes extend four or five inches beyond the tail. The smaller egret develops a similar train, also some decomposed feathers on the breast. In the little egret a similar train is developed but no breast plumes. These breeding ornaments are all white.

In the case of the cattle egret the dorsal plumes which develop in the breeding season are not so long, and are orange buff; these form the "buff ospreys" of commerce. These plumes are very valuable and fetch as much as £1 an ounce. I shall refer again to them after describing briefly the habits of the egrets. Egrets feed largely on fish, molluscs and other aquatic organisms; they go about in flocks which may contain only a few individuals or be composed of several hundred. Sometimes a flock consists of more than one species. These birds haunt marshes, paddy fields and all other places where there is shallow water. Cattle egrets often frequent swamps, but more frequently they hunt for food in small companies on comparatively dry land. They are called cattle egrets because they usually accompany grazing cattle. These, as they wander about, put up grasshoppers and other insects that live in the grass, which are eagerly seized by the cattle egrets strutting alongside their great mess-mates. Thus the cattle act as beaters for the egrets. Everyone who has lived for any length of time in India must have seen snow-white cattle egrets accompanying grazing cattle.

Now, herons, whether they feed in solitude or in company, usually roost in company and invariably breed in large colonies, which are spoken of as heronries. During the rains they make stick nests on low trees, usually those which grow by the side, or out of water. An idea of the size of some of these colonies of breeding herons may be gathered from the following facts. At Etawah, Hume once counted 198 nests of paddy birds, cattle and lesser egrets in some tamarind trees in a Muhammadan graveyard. On one nearly horizontal branch he counted,

in a length of 21 feet, 18 nests. There is a tank near Chingleput in the Madras Presidency, in which grow, or used to grow, five or six hundred trees of *Barringtonia racemosa*, which become partially submerged during the monsoon. This place forms the breeding resort of an immense number of herons, open-bills, ibises, cormorants, darters, paddy birds and egrets. Each tree is said to appear like a moving mass of black, white and grey, the white plumage of the egrets and ibises contrasting with the black of the cormorants and darters and the grey of the paddy birds. Each of the five hundred odd trees contains from ten to twenty nests.

Now, since the breeding plumes of egrets are so valuable, there used to be a great trade in these, and millions of such plumes were exported annually from India. Many of the plume hunters used to trap the birds and pull out their plumes (a simple operation and one apparently involving little pain to the birds and which could be made quite painless were scissors used to snip them off), and then restore to liberty deplored birds, none the worse for their experience; but other hunters ruthlessly killed the breeding birds. The result of this was that the Government of India totally prohibited the export of plumage from India. This drastic measure is, in my opinion, unnecessary. The birds of India are a most valuable asset and, under proper restrictions, a large revenue might be derived by the export of plumage without entailing any cruelty and without diminishing the avifauna of the country; indeed the population of useful birds could be largely increased under proper management.

In Sind egrets are actually farmed and the nuptial plumes collected as they grow. In the natural state these plumes grow only once a year; but it appears to be a well-established fact that the egrets that are farmed grow these plumes four times in the course of the year. Let us hope that the day is at hand on which the financiers employed by the Government of India, having retrenched to the utmost limit, will adopt a policy of expanding the revenue by drawing upon hitherto untouched resources of the country.

NON-PASSERINE LAND BIRDS.

I.—Woodpeckers.

We have considered the sportsman's birds and the wading birds; we have now to deal with the non-passerine land birds. These form a most interesting collection.

I must confess that, when dealing with woodpeckers, my feelings are akin to those of the old woman who lived in a shoe.

More than fifty species are found in India. If I select a few to describe and ignore the rest, one of the latter will certainly show itself to some reader; then the reader in question will feel himself aggrieved, because I have not described this particular bird.

As I am not in a position to whip all woodpeckers soundly, much less to send them to bed, I am compelled to find another solution to the difficulty. I think that the best will be for me to discourse generally on the habits of woodpeckers, because they are highly-specialised birds, and, in consequence, of uniform habits, and then to take each of the common woodpeckers and describe it, and, along with it, some of its less widely-distributed relatives. Thus shall I gather most of them into my 'shoe.'

Woodpeckers are birds that rarely descend to the ground and seldom sit crosswise on a branch. They spend their time on the trunks and larger branches of trees, seeking the insects on which they feed. They have powerful legs and toes to enable them to grip the bark sufficiently firmly to support themselves on a vertical tree trunk. In this they derive much assistance from the stiff feathers of the tail. It is scarcely exaggeration to say that the tail of a woodpecker plays the part of a third leg. A woodpecker feeding on a trunk invariably has the head pointing upwards. The usual method is to fly to the lower part of a tree trunk and work upwards by a series of jerks like those made by some mechanical toys, the bird picking up insects as it ascends. When it gets near the top of the tree it flies, in a series of undulations, to the lower part of another tree, where the performance is repeated. I do not mean to say that a woodpecker on a tree trunk always moves upwards: it sometimes descends a short distance, but, when this happens, it goes backwards with head pointing to the sky. A woodpecker working its way up a tree usually does so in an irregular spiral; it is able, with apparently equal ease, to jerk itself forwards, sideways and backwards.

The tongue of a woodpecker is a curious structure. It is long and rounded like a worm. It can be protruded a long way: when not protruded it is coiled up at the base. It is covered with very sticky

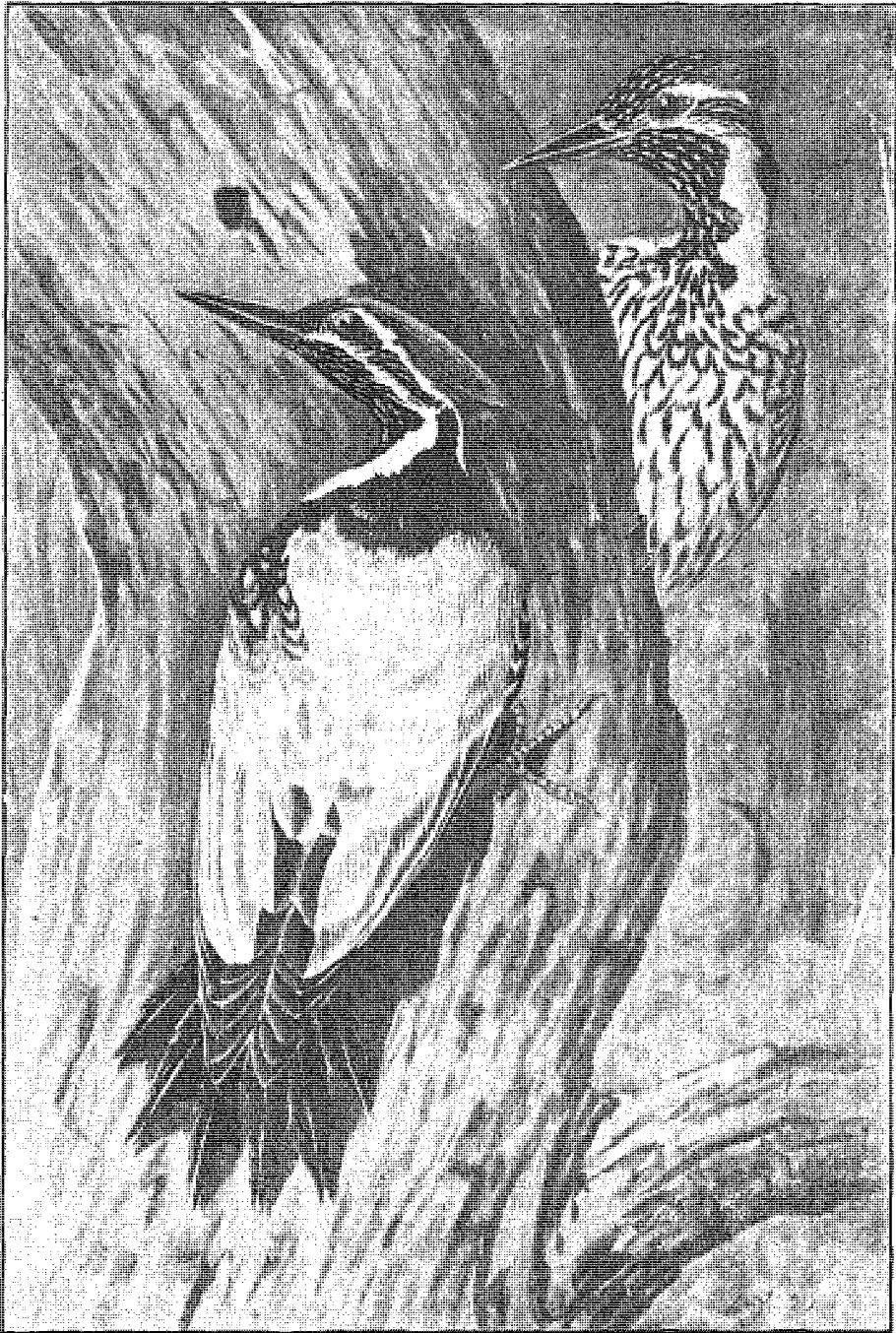
saliva, so that every insect with which it comes into contact adheres to it: it is nothing but a living fly-paper. As the woodpecker quarters a trunk, it seizes with its fly-paper-tongue every insect it sees and then withdraws its tongue and swallows the victim. It often taps the bark with its powerful chisel-like bill in order to dislodge those insects that are lurking in the crevices which its tongue cannot reach.

With the bill the woodpecker hews out a nest-chamber in a tree-trunk, or, rather, a neat circular tunnel leading to a hollow part of the tree. It is interesting to watch a woodpecker when engaged in excavation. The bird holds firmly on to the bark with its claws and uses the tail as a support; it throws back its head and then jerks it violently forward, so that the sharp tip of the bill chips away a small piece of the trunk and the operation is repeated rapidly. In a short time an appreciable amount of the wood is chipped away. The noise of each stroke of the bill may be heard a long way off. In order to fit it for this navy's work the woodpecker is provided with very powerful muscles at the back of the head and the neck. At the incipient stages of nest construction the chips of wood cut by the bill fall naturally to the ground, but, as the tunnel grows in length, the bird has to throw out with its bill, over the shoulder, the pieces it has cut away. Everyone must have noticed how beautifully smooth and rounded the tunnel made by the woodpecker is: it entirely puts to shame the average Indian carpenter! The diameter of the tunnel naturally varies with the size of the woodpecker that makes it; it is just large enough to enable the bird to enter and leave the nest without rumpling its feathers.

The most familiar woodpecker of all parts of the plains of India, west of Assam, is the beautiful golden-backed species (*Brachypternus aurantius*). This is nearly a foot in length. The most conspicuous features in its plumage are the crimson crest and the golden back. The lower back and tail are black. The wings are black and golden yellow. The breast is white with black spots. The sides of the head are white, with a network of black lines.

Although the golden-backed woodpecker occurs in Ceylon, another very similar woodpecker is found there alongside it. This is known as the red-backed woodpecker (*B. erythronotus*). It is peculiar to Ceylon, and is distinguished by the bright crimson back.

The common golden-backed woodpecker does not ascend the hills higher than about 3,000 feet; there is, however, a larger and finer golden-backed woodpecker that lives in the Himalayas, the Nilgiris, and Burma known as Tickell's golden-backed woodpecker (*Chrysocolaptes gutticristatus*). This has two near relatives: the black-backed woodpecker (*C. festivus*) found in the Terai and other parts of India, and Layard's woodpecker (*C. stricklandi*). The latter has a dull crimson back. It is confined to Ceylon, where it is a rare bird.



THE GOLDEN-BACKED WOODPECKER (*BRACHYPTERNUS AURANTUS*)—
Male left, Female right.

There are two other golden-backed woodpeckers, which, unless held in the hand, are likely to be mistaken for the common species. These have only three toes, two in front and one behind, while the majority of woodpeckers possess four—two front and two hind toes. The fact that they are minus a toe does not appear in any way to handicap these birds in the struggle for existence; this should cause those who believe that every small variation in an animal means the difference between destruction and preservation furiously to think. The three-toed golden-backed woodpeckers referred to above are the common golden-backed three-toed woodpecker (*Tiga javanensis*), found in Burma and South India, and the Himalayan golden-backed three-toed woodpecker (*T. shorei*), which occurs in the Himalayas and Burma.

After the golden-backed woodpecker, the commonest species of this family in India is the yellow-fronted pied woodpecker (*Liopicus mahrattensis*). The very long English names for the various Indian woodpeckers are, of course, due to the abundance of species. If the English name is to be properly descriptive it must be long enough to please an arch-snob. The yellow-fronted pied woodpecker is about the size of a myna. As the name implies, the plumage is black-and-white and the forehead yellow. The wings are black with white spots, and the tail is white with black bands and spots. The cock has the forehead yellow and a red crest. The head of the hen is dull yellow. There is a patch of red on the abdomen, but the habits of the bird are such that this patch is rarely seen. This woodpecker is spread all over the plains of India from Rawalpindi to a few miles west of Calcutta. It is also found in the northern parts of Ceylon. In Sind and the North-West Frontier Province, it is replaced by the Sind pied woodpecker (*Dendrocopus sindianus*). This looks very like the yellow-fronted pied woodpecker, but the black on its wings takes the form of regular crossbars rather than irregular spots. This is the common pied woodpecker of Peshawar. When I was there one May, I noticed a pair feeding young in a hole in the lower part of the trunk of a tree near the gate of a bungalow in one of the busiest thoroughfares. The nest was so situated that any passer-by could, without effort, place a finger in the nest cavity.

The fulvous-breasted pied woodpecker (*D. macii*) replaces the yellow-fronted species in Eastern Bengal. It is common around Calcutta and occurs along the base of the Himalayas. The back is black-and-white; the head is red in the cock and black in the hen.

Two pied woodpeckers are common at the hill stations of the Western Himalayas. These are the Western Himalayan (*D. himalayensis*) and the brown-fronted (*D. auriceps*). In the former the back is entirely black, in the latter it is barred with white. The Western Himalayan species is common in Kashmir.



THE WESTERN-HIMALAYAN PIED WOODPECKER (*DENDROCOPUS*
HIMALAYENSIS)—MALE.

In the Eastern Himalayas there are also two pied woodpeckers—the Darjeeling (*D. darjeelensis*) and the lesser pied woodpecker (*D. cathpharius*.) Both these have black backs, but the latter is the smaller being seven inches long, as opposed to nine-and-a-half inches.

The pied woodpecker of Upper Burma is the spotted-breasted species (*D. pectoralis*), that of the Andamans is the Andaman pied woodpecker (*D. andamanensis*). These two species, like the yellow-fronted pied woodpecker, have the middle tail feathers black-and-white: in all the other pied woodpeckers they are entirely black.

Let me now pass on to the pigmy woodpeckers. These are simply miniatures of the pied woodpeckers. They are smaller than sparrows, they vary in length from 4.8 to 5.5 inches, while the sparrow can boast of a length of six inches.

They are all black (or brown) and white birds; the upper parts being black, or brown, with white crossbars, and the lower parts grey, with longitudinal brown or black streaks.

The Indian pigmy woodpeckers fall into five species or races: The Indian pigmy woodpecker (*Iyngipicus hardwickii*) found all over the plains of India; the Ceylon pigmy woodpecker (*I. gymnophthalmus*) found in South India and Ceylon; the Burmese pigmy woodpecker (*I. canicapillus*) which lives in Burma and Assam; the Darjeeling pigmy woodpecker (*I. semicoronatus*) found in the Eastern Himalayas; and the Himalayan pigmy woodpecker (*I. pygmaeus*), which ranges from Katmandu to Mussoorie. These birds often perch on branches and sometimes cling to boughs after the manner of tits.

While on the subject of pigmies, let me mention the midget known as the speckled piculet (*Picumnus innominatus*). This is but four inches long, nevertheless it has the habits of a woodpecker, even to boring a nest-hole in a tree. It often feeds on the ground. Its plumage is orange yellow, barred with brown. It occurs in the Himalayas, west of Murree, in Assam and, rarely, in the hills of South India.

The green woodpeckers next demand our attention. These are related to the green woodpeckers of England. They often pick their food off fallen trunks and off the ground. They have the back olive green, and the wings and tail black, with white and yellow bars and spots. The head is red in the cock and black in the hen.

The *Fauna of British India* describes nine Indian species, but only six are entitled to a place among the common birds of India. Let us glance at these. The West Himalayan scaly-bellied green woodpecker (*Gecinus squamatus*) is the commonest woodpecker at Murree, Mussoorie and other stations in the Western Himalayas. The feathers of the lower parts are greenish white, but each has a black band near the margin, which gives the under-parts a scaly appearance. This bird is 14 inches long. The little scaly-bellied green woodpecker (*G. strio-*



THE MALABAR GREAT BLACK WOODPECKER (*THRIPONAX HODGSONI*) IN CENTRE.
 THE HIMALAYAN PIGMY WOODPECKER (*LYNGIPICUS*) AT SIDES.
 FEMALE LEFT, MALE RIGHT.

latus) is $11\frac{1}{2}$ inches long. It occurs in the Western Himalayas and in the forest country of the plains of India, in Burma and on the Western Ghats. A commoner bird in Burma is the Burmese scaly-bellied green woodpecker (*G. viridanus*). This is 13 inches long and the rump is yellowish green, whereas in the species previously mentioned it is yellow.

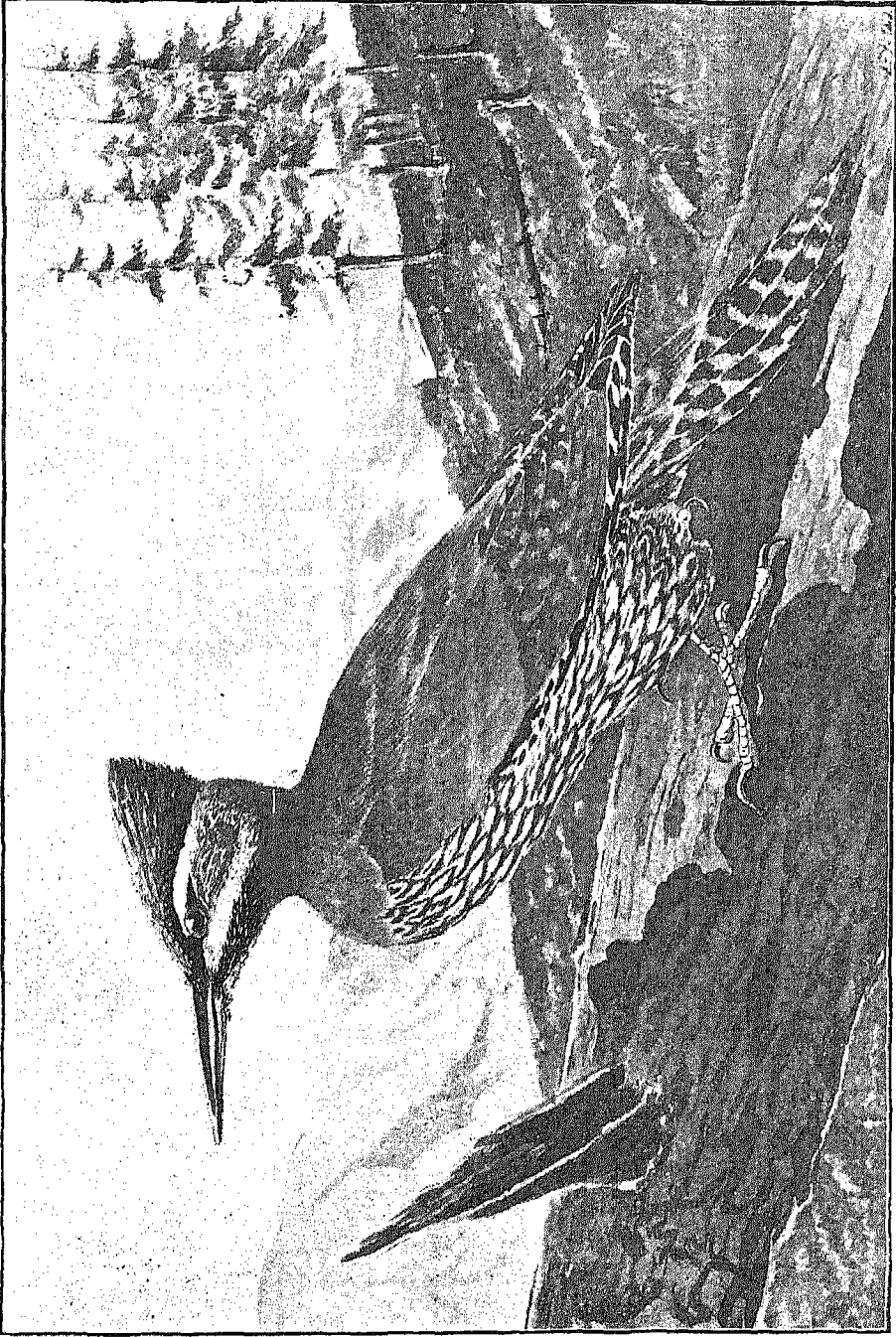
Another common Himalayan woodpecker is the black-naped green woodpecker (*G. occipitalis*). This is $12\frac{1}{2}$ inches in length: it may be distinguished by the black nape and the plain grey lower plumage.

There are two green woodpeckers which display a bright yellow tuft of feathers growing from the back of the head. These are the small Himalayan yellow-naped woodpecker (*G. chorolophus*) found in the Himalayas, Assam and Burma, and the South Indian yellow-naped woodpecker (*G. chlorogaster*) which inhabits the hills of South India.

It is, perhaps, fitting that I should mention the giants among woodpeckers, although probably not one of them should be described as a common bird. There is the great slaty woodpecker (*Hemilophus pulverulentus*) which is 20 inches long. Its plumage is dark grey with yellow on the throat. The cock has a crimson patch behind each eye. This bird inhabits the forests of the Himalayan Terai, Assam and Burma. The so-called black woodpeckers, which are four in number, vary in size from 19 to 15 inches. They are (1) the Malabar great black woodpecker (*Thriponax hodgsoni*) found in South India—a pied bird with the head and nape crimson. (2) the Burmese great black woodpecker (*T. feddeni*). This is smaller than the Malabar species, with more white in the plumage. (3) The Malay black woodpecker (*T. javensis*) found in Tenasserim. This has a white rump, that of the others being black. (4) The Andamanese black woodpecker (*T. hodgii*). Except for some red on the head, the whole of the plumage of this bird is black.

Having disposed of the giants I will, in conclusion, notice the freaks among Indian woodpeckers. These unfortunately are not very common although of fairly wide range.

The red or rufous woodpeckers are in size between that of the common golden-backed and that of the brown-fronted pied woodpecker. They feed largely on tree ants. This perhaps accounts for the unpleasant smell which they emit. Their plumage is usually smeared with a sticky fluid found in ants' nests, and bodies of ants sometimes adhere to the tail feathers. They lay their eggs in holes made in ants' nests in trees. The plumage is pale chestnut, barred with black. The male has a crimson patch below the eye. There are two races in India: the northern rufous woodpecker (*Micropternus phaeocephus*) and the Malabar rufous woodpecker (*M. gularis*). The latter is a smaller race found on the Malabar Coast and



THE WEST HIMALAYAN SCALY-BELLIED GREEN WOODPECKER (*GECINUS SQUAMATUS*), MALE.
This bird frequently obtains its food on fallen trunks of trees and on the ground.

in Ceylon. The northern form ranges from Dehra Dun to Moulmein. The other curiosity is about the size of a sparrow: it is known as the heart-spotted woodpecker (*Hemicercus canente*). It is a black-and-buff bird. Some of the wing feathers are buff, each with a heart-shaped black spot near the end, whence the name of the bird. There is in the middle of the back a tuft of bristly feathers which are, to quote the *Fauna of British India*, "smeared with a viscid secretion having a peculiar resinous scent." This bird occurs in Burma and the forests on the Malabar Coast and perhaps in those of Central India.

I fear that the above is rather dull reading, but this is inevitable. It is, I submit, impossible to compress an account of a large number of birds into small compass without the result partaking of the nature of a catalogue. The woodpeckers, however, are a most interesting family of birds, to the student of evolution. The cocks usually differ slightly from the hens in appearance. As woodpeckers incubate their eggs in hidden recesses in trees, there is no need for the sitting bird to be inconspicuous when incubating. Even if there were, and the hen alone incubated, there is, as regards conspicuousness, nothing to choose between the liveries of the sexes. The truth appears to be that in the progress of any species, the cock is usually a little way ahead of the hen. New characteristics—mutations—first appear in the male and later show themselves in the female. The tendency is for woodpeckers to become brightly coloured, and, as they nest in holes and dwell in forests, where birds of prey cannot hunt, there is no reason why nature should not have full license in the matter of colouring woodpeckers. Thus it is that there is such a riot of colouring in the family. There are green, black, pied, golden-backed and chestnut woodpeckers, and all these display patches of bright crimson or yellow. Every colour of the spectrum, except blue and violet, appears in their plumage. These missing colours are, curiously enough, common colours in broadbills. For some reason unknown to us woodpeckers seem to be unable to put forth blue variations. Darwin was mistaken in thinking that all animals vary indiscriminately in all directions. Evolution is not the haphazard affair which he thought it to be. It is taking place along definite lines. The more advanced zoologists of to-day are trying to discover what these lines of development are.

The old-fashioned ones spend most of their time in the adoration of Darwin !

II.—Broadbills.

As the name implies, the beak of broadbills is broad and flat—in some species it is nearly as broad as it is long. In shape it resembles the mouth of a frog: it is an excellent apparatus for catching the in-

sects on which broadbills feed. Nine species of broadbill are found within the limits of the Indian Empire, but six of them may be ignored by us, as they occur only in remote Tenasserim. Three dwell in the Himalayas and the hills of Assam and Burma.

The only species found in the Western Himalayas is the very beautiful long-tailed broadbill (*Psarisomus dalhousiae*). This is ten-and-a-half inches in length, of which the tail accounts for nearly one-half. The sexes are alike in appearance. Like Joseph the Patriarch, in his youthful days, they wear a coat of many colours. Bright grass green is the preponderating hue of the plumage. There is a bright blue patch on the crown of the head and much of this colour in the wing, which is further embellished by a smart white wingbar, visible when the wing is expanded. The tail is blue above and black below. The blue patch on the crown is encircled by a broad black band. Below this black band is a narrower one of vivid yellow, which shades off into the orange of the throat. In the black band, behind each eye, is a strip of yellow. The head colouring would make a striking pattern for a cricket cap. The bill and legs are bright green. The tail is much graduated, the middle pair of feathers being the longest.

The nest of this magnificent species is a large edition of that of the sun-bird. It is pear-shaped, over a foot in length, made of grass, roots and twigs, often lined with leaves. Like the nest of the sun-bird, it has a portico-protected entrance at the side. It hangs from the branch of a tree or other convenient structure. For several years a pair of these broadbills hung their nest from the wires that run from the electric power station at Mussoorie. I saw their nest in 1914 and again in 1917, and Major Peile saw it in 1916. A fresh nest was built every year. In 1919 there was no nest hanging from the wires, but I saw one in the same valley at a distance of about half a mile from the power-house. When I saw the nest on the 29th June, 1914, the parents were feeding young ones with caterpillars. Squeaks, like those emitted by black bulbuls, emanated from the nest. When I saw the nest on the 11th June, 1917, it appeared to contain eggs.

The long-tailed, or, as Jerdon styles it, the yellow-throated broadbill, ranges from Mussoorie through the Himalayas, Assam and Burma to Borneo.

The other two broadbills are about the size of the sparrow. The wings and tail are black and white, the rump is chestnut red, the rest of the upper parts is greyish brown. The hen alone has a white gorget. They are Gould's broadbill (*Serilophus lunatus*) and Hodgson's broadbill (*S. rubipygius*). The former has the head brown, rather than grey, and is not found west of Burma. The latter extends as far west as Nepal. Except that the birds are more gregarious, their habits are similar to those of the long-tailed broadbill.



THE LONG-TAILED BROADBILL (*PSARISOMUS DALHOUSIAE*).
MALE, FEMALE AND NEST.

III.—Barbets.

We now come to the barbets. These are stout-billed, stumpy, short-tailed birds which keep to trees and feed largely on fruit. They nest in holes in trees which they themselves hollow out, after the manner of woodpeckers. They have loud monotonous calls, which they are very fond of uttering, especially during the hot weather, and are in consequence, the cause of much bad language on the part of those Europeans who are condemned to swelter in the plains during the hot weather.

Eighteen different kinds of barbet occur in India; of these only five or six are entitled to a place among the common birds.

The commonest of them all is the coppersmith or crimson-breasted barbet, which men of science have saddled with the name *Xantholaema haematocephala*. This bird is called the coppersmith on account of its call, which resembles the sound made by the human coppersmith when tapping the copper on which he works. From February till the end of October this little bird spends more than half the day calling *took, took, took, took, or tonk, tonk, tonk, tonk*. Sometimes the bird will say "tonk" fifty times without halting to take breath. The hotter the day the more vigorously it calls. As the bird is found throughout the plains of India, its call is one of the most familiar sounds of the Indian countryside. The coppersmith is about the size of a sparrow. The body, wings and tail are green. The forehead and part of the neck are bright crimson. The chin, throat and a patch above the eye are vivid yellow. A black band runs from the beak to the side of the neck and then turns upward to the top of the head. The legs are bright red. Although the head is so brightly coloured and the bird calls so frequently and loudly, the coppersmith has to be looked for carefully by him who would see it, because it lives among the green foliage, and, when it calls, it wags its head from side to side, with the result that the sound seems to come from where it is not uttered. Sometimes two coppersmiths call to each other and, if, as often happens, one calls faster than the other, the phenomenon of musical beats results.

In the spring the birds pair and excavate their nests in the trunks or branches of trees; when the nest is in a branch it is invariably begun on the under surface of the branch, so that, if it rains, the nest does not get flooded. The nest is usually retort-shaped; the channel leading to the egg-chamber is neatly rounded and is about the diameter of a rupee. The stout, strong bill of the barbet enables it to chip away the wood with ease. From two to four white eggs are laid.

Two other *Xantholaema* barbets are found in India. The crimson-throated barbet (*X. malabarica*), as its names imply, has a crimson throat and lives on the Malabar Coast south of Ratnagiri. The small



THE SMALL GREEN BARBET (*THERICEVYX VIRIDIS*) IN CENTRE. THE CRIMSON-BREADED BARBET OR COPPERSMITH (*XANTHOLAEMA HAEMATOCEPHALA*).
 MALE RIGHT, FEMALE LEAVING NEST ON LEFT, OUTSIDE CIRCLE.

Ceylon barbet (*X. rubricapilla*) has an orange throat and blue cheeks. It is confined to Ceylon.

Almost as abundant and widespread as the coppersmith is the common Indian green barbet (*Thereiceryx seylonicus*). According to the *Fauna of British India*, this bird is found everywhere in the plains of India except Burma, Lower Bengal, the Punjab, Sind and parts of Rajputana. This was doubtless correct when it was written thirty years ago. Since then this barbet has extended its range and I have noticed it at Lahore.

Its call, which is uttered as persistently as that of the coppersmith, is a loud *kutur, kutur, kuturuk*, preceded by a kind of chuckle.

This barbet is about the size of a myna. It is a green bird with a yellowish-brown head and an orange patch of bare skin round the eye. Its nesting habits are like those of the coppersmith.

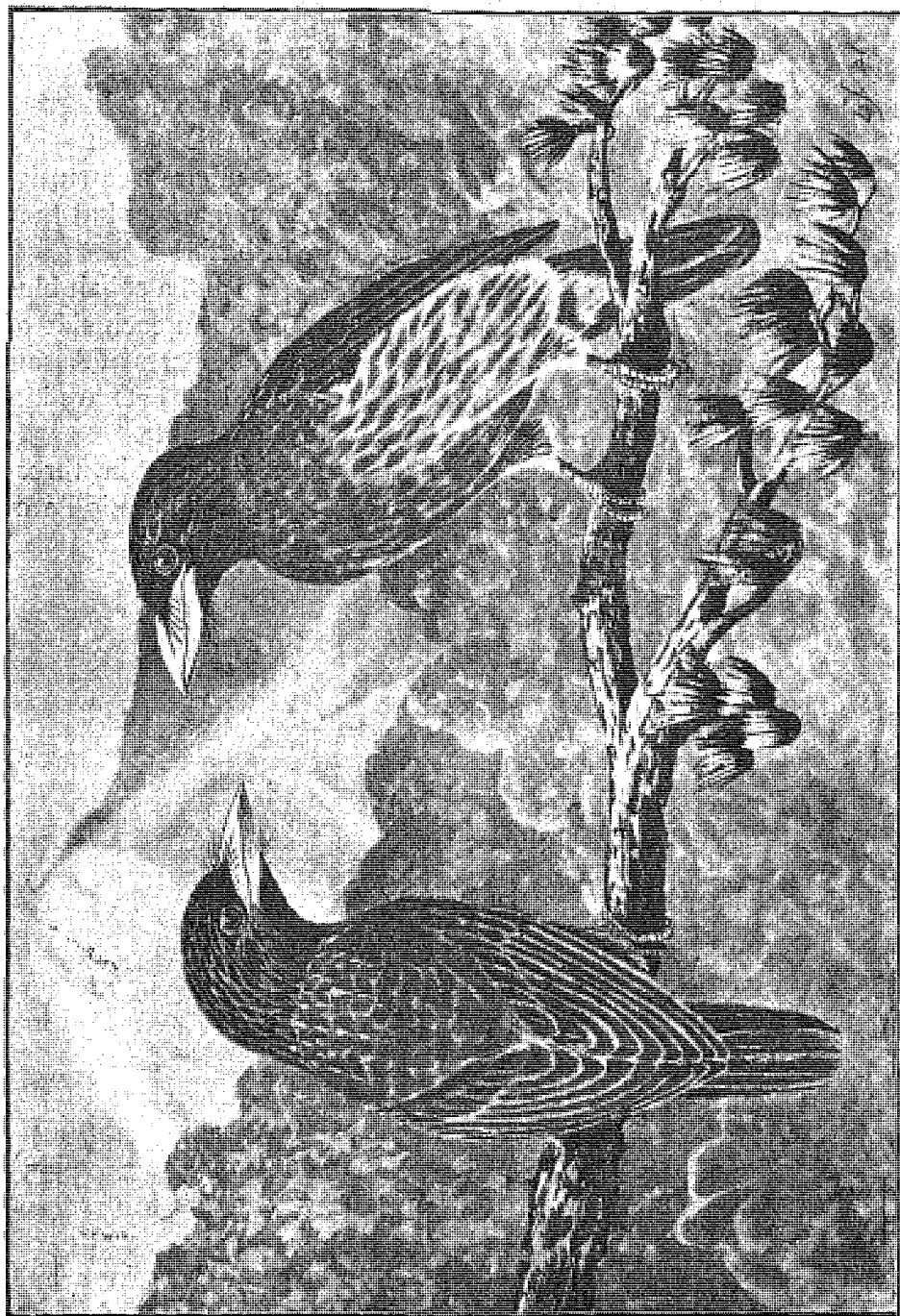
In the Nilgiris and other hills of South India the common green barbet is replaced by a smaller edition called the small green barbet (*T. viridis*). This has the habits and call of the larger species from which it is distinguished by being nine inches long instead of ten-and-a-half, and having a smaller patch of yellow skin round the eye. In Assam and Burma the green barbets are a little larger than the common Indian one, but have less bare yellow skin round the eye. Their habits and call are similar, but they have been constituted a different species and named the lineated barbet (*T. lineatus*). The three are obviously geographical races of one and the same species. The common barbet of the Himalayan hill stations is a fine bird, known as the Great Himalayan Barbet (*Megalaema marshallorum*). As the name indicates, this is the largest barbet in India. It measures thirteen inches, of which the tail accounts for four; its call is a loud, plaintive *pi-o, pi-o*, which resounds pleasantly through the valleys. Its prevailing hue is green, olive on the upper back and grass coloured on the lower back and tail. There is some brown in the wings, and the breast is olive brown. The head and neck are deep violet blue. The abdomen is blue in the middle and yellow, with brown streaks at the sides. There is a scarlet patch of feathers under the tail. The nesting habits of this barbet are similar to those of the coppersmith. In Tenasserim this species is replaced by the great Chinese barbet (*M. virens*). This is a local race, having the head pale greenish blue.

In conclusion, let me speak of the *Cyanops* barbets. Perhaps, none of these is sufficiently numerous or widespread to merit a place among the common birds of India. It is, however, desirable to mention them, as one or other is likely occasionally to be seen.

The blue-throated barbet (*Cyanops asiatica*) is common in the Himalayas up to about 4,000 feet as far west as Chamba: it also occurs in the sub-Himalayan forests and in Lower Bengal, Assam and Burma. The



THE INDIAN GREEN BARBET (*THEREICERYX ZEYLONICUS*). MALE AND FEMALE.



THE GREAT HIMALAYAN BARBET (*MEGALAEMA MARSHALLORUM*). MALE AND FEMALE.

only place where I have seen it near Rajpur, below Mussoorie. This like most of the other Cyanops, is intermediate in size between the copper-smith and the common Indian green barbet. It is a green bird, washed with blue on the tail. As the name implies, the chin, throat and fore-neck are blue—pale greenish blue. The head is crimson, banded with black. There is a crimson spot on each side of the foreneck and a tiny one on each side of the base of the bill. I find that I have no note regarding its call. According to the *Fauna of British India*, this barbet is “a noisy active bird, living on fruit and having a peculiar frequently-repeated trisyllabic call.” This, I fear, is not very illuminating; but then the *Fauna* is not strong on the subject of the calls of birds!

The blue-eared barbet (*C. cyanotis*) has a black cap and a cobalt blue nape. The ears are blue and there is a good deal of red on each side of the head. This bird is found in Sikkim and the most hilly parts of Assam and Burma. Its nesting habits, and indeed, those of all barbets are like those of the coppersmith. It has a harsh metallic double note.

The golden-throated barbet (*C. franklini*) has a golden chin, throat and cap; a crimson forehead and a patch of this hue on the middle of the nape. It is found in the Eastern Himalayas and the hills of Assam.

Ceylon has a Cyanops barbet of its own. This is called the yellow-fronted barbet (*C. flavifrons*). The forehead is golden yellow.

IV.—Rollers.

Rollers are birds of startling colouring. The commonest species in India reminds one of Putney on boat-race day, and is usually called the “blue jay” by Europeans in India. It is, however, not a jay, nor is it related to the jay family. Its nearest relatives are, perhaps, the kingfishers, since in these the deep plantar tendons are similarly arranged. But let us not trouble ourselves with the dry bones of ornithology. We may leave it to systematists to rake about among these, and confine ourselves to the beautiful living bird to the bird in the bush, which, in my opinion, is worth a dozen dead ones in the hand.

The Indian roller (*Coracias indica*) is found in most parts of the plains of India, and everywhere, except perhaps the North-West Frontier Province and parts of Bombay and Madras, is one of the commonest birds of the countryside. It is, however, rather rare in Calcutta gardens.

It is about the size of the common house-crow. The wings and tail are very broadly banded with pale and dark blue; the head, neck and back have the hue of a faded port-wine stain, washed in parts with bluish green and lilac. The shaft of each feather is almost white. The eye is gamboge yellow. The roller is not much to look at when perched, because its shape is not very elegant and the blue of the wings and tail

is largely concealed. Flight transforms it. As it flaps its large rounded wings in the Indian sunlight, it is indeed a thing of beauty.

The roller of Burma differs slightly in appearance from the Indian form, hence some ornithologists have made a different species of it and call it the Burmese roller (*C. affinis*). This bird extends as far east as Tipperah. The head is blue and green, and the back and shoulders olive green. The under parts of the wings are dark instead of pale blue as in the Indian form. The Burmese bird, in consequence, is not nearly so brilliant an object during flight.

The rollers that inhabit the tract of country between Calcutta and Tipperah do not quite tally with either of the above descriptions, being intermediate forms, or hybrids, if the two be regarded as different species. In nature it usually happens that at places where nearly-allied species of different geographical distribution meet, the two species interbreed freely and produce intermediate forms. We have seen that this is the case with the Bengal and the Southern green pigeon. As we shall notice later, a similar phenomenon occurs in the case of the red-vented bulbuls.

The intermediate forms thrive equally with the parent varieties; this fact goes to show that details in colouring matter very little to the bird so far as the struggle for existence is concerned. The Burmese birds would undoubtedly get along quite as well as they now do, were they coloured like the Indian ones, and *vice versa*.

People who have visited Kashmir must have noticed that the rollers seen in the valley of the Jhelum and those that flourish at the Wular lake differ in colouring slightly from those found in the plains of India. The rollers of Kashmir belong to the European species—*Coracias garrula*, the European roller. The forehead and chin of this form are greyish white, and the head, neck and wing lining are pale greenish blue. Hence, this is the most showy of the three species. It occasionally visits the plains of India and has been observed as far east as Lucknow and as far south as Dhulia.

Rollers feed chiefly on insects, but often capture much larger quarry, as, for example, fieldmice, frogs and small snakes. The roller usually captures its victim on the ground, swooping down upon it from a fence, a post, a branch of a tree, or other point of vantage. Sometimes it seizes its victim in the air after the manner of flycatchers. Although rather a big and heavy bird, it is an aerial gymnast—no other bird performs such strange tricks in the air.

The roller usually gives these acrobatic performances in the spring at the beginning of the nesting season. It rises and falls, twists, turns, zig-zags and “jinks” in much the same way as a house-fly does, the while uttering very harsh cries, which are the nearest approach to song that the roller is capable of. Birds of which the voice is anything but



INDIAN ROLLER (*CORACIAS INDICA*) SHOWING OFF, ON THE WING.

musical seem to be the ones that are most vociferous. At the nesting season the roller is so noisy as to make itself almost a nuisance. The nestlings vie with the parents in making a din. Once at Lahore a pair of rollers reared up a family in one of the chimneys of the bungalow I was occupying. The young hopefuls kept up a continuous uproar throughout the day; and, had it been possible for a man to have got at the nest, I should certainly, for the sake of my nerves, have had the brood destroyed.

In July 1921, when walking in the Lawrence Gardens at Lahore, my attention was arrested by a harsh noise emanating from a hole in a eucalyptus tree. I looked up and saw, peering out of the mouth of the hole, a baby roller, almost ready to fly. On turning round I beheld the parent bird with a large grasshopper in the bill. I stepped aside to see the young bird fed, but the parent displayed an unusual degree of timidity, refused to go near the nest and eventually swallowed the grasshopper and flew away. Meanwhile, the nestling was making more noise than ever. Rollers usually lay their eggs in holes in decayed trees; sometimes they select a hole in a building. In June 1921, I saw a roller's nest, containing five eggs, in a niche in the wall of a much-frequented courtyard. The niche was barely eight feet above the ground, so that the passers-by—and there were scores of these daily—could handle the eggs without the aid of a ladder. There were in the immediate neighbourhood several trees offering, in the words of the estate agent, highly desirable sites; nevertheless, this pair of rollers selected the dangerous position in the wall of the much-used courtyard.

The nesting season extends from March to early August, and four white eggs are usually laid. I have described the habits of the Indian roller, but what I have said applies equally to the other two species, the habits of which are in all respects similar to those of the Indian form. The European race, however, is sometimes found far away from trees, and, in such circumstances, will nest in a hole in a cliff or sandbank.

The broad-billed roller (*Eurystomus orientalis*) is not sufficiently abundant to be entitled to a place among the common birds of India. As, however, it occurs in the forests along the base of the Himalayas and in those of Burma and South India, it may be stated that this is a roller with vermilion bill and legs, a dark brown head and some black in the wings and tail, which are mainly blue.

V.—Bee-Eaters.

Bee-eaters are as beautifully coloured as rollers and have the additional attraction of grace of form. They are among the most

resplendent birds in the world, and have very winning ways. Seven species occur within Indian limits, two of which are widely distributed and numerous throughout their range; they are to be numbered among the common objects of the Indian countryside.

The common bee-eater (*Merops viridis*) is often mistaken by Europeans for a fly-catcher, because it captures its insect quarry in the air after the manner of fly-catchers. Bee-eaters have no connection with fly-catchers, no more than rollers have with jays.

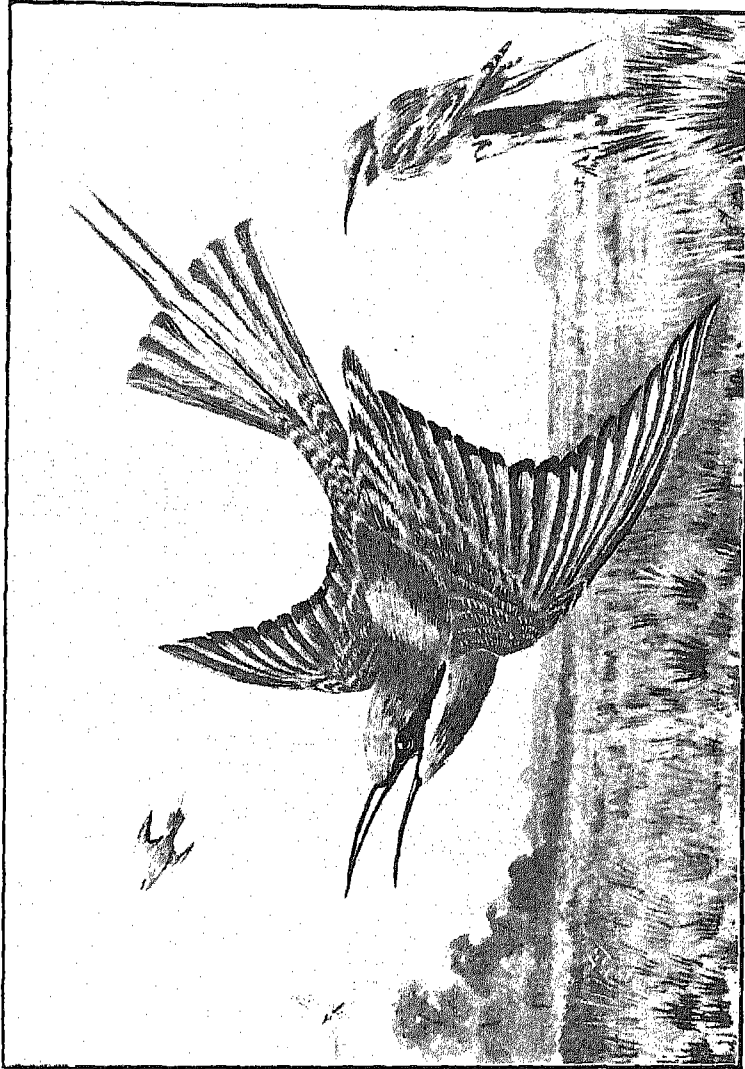
The prevailing hue of the common bee-eater is rich green, which some writers have compared to that of the emerald, and others to that of a well-watered lawn. There is some gold in the wings and the crown is tinted with this hue. There is a black band through the eye and a black gorget. The chin is turquoise blue and the eyes resemble rubies. The bill is rather long, with a slight downward bend, and tapers to a fine point.

The two middle tail feathers are narrow and wire-like at the tip, which is black. They project nearly two inches beyond the others and give the bird a distinctive appearance. It is impossible to mistake a bee-eater. A slender bright-green bird, about the size of a bulbul, with the middle pair of tail feathers projecting like wires, that sits on a telegraph wire or other exposed perch, and makes frequent short sallies into the air, when its short wings look alternately gold and green, which frequently utters a sweet, soft, low whistling note, can be none other than the common bee-eater.

This and the other kinds of bee-eaters feed exclusively on insects which they take on the wing. In the spring they excavate with the sharp bill a tunnel in a cliff or sandbank. This tunnel varies in length from 1½ to 5 feet, according as the soil in which it is dug out is hard or soft. At the blind end of the tunnel, three, four or five round, white eggs are laid on the bare soil. Bee-eaters not infrequently excavate their nests in the butts of a rifle-range. I once found a nest under the upper dressing of stones in a road raised a few inches above ground-level. The nest tunnel is always horizontal or nearly so. Young bee-eaters are dull editions of the adult and have all the tail feathers the same length. Sometimes twenty or thirty of these may be seen, in June or July, sitting in a row on a fence.

Bee-eaters, like sparrows and hoopoes, revel in a dust bath and may often be surprised when performing their toilette on a dusty path.

The common bee-eater occurs all over India and Burma, ascending the Himalayas to 5,000 feet in the neighbourhood of Simla, but in most localities 3,000 feet seems to be the limit. This species undergoes local migration, being only a summer visitor to the Punjab and North-West



BLUE-TAILED BEE-EATER (MEROPS PHILIPPINUS).

Frontier Province, and a winter visitant to the island of Bombay. I am not able to say, in parts of the country where it occurs throughout the year, whether the individuals seen in summer are identical with those observed in winter.

Nearly as abundant as the common bee-eater is the larger species known as the blue-tailed bee-eater (*M. philippinus*). In my opinion this is not so handsome a bird as the common species. It has the same green plumage, the black band through the eye, and the elongated medium tail feathers.

The eye is a rich crimson, the tail is washed with bright blue, the chin is yellow and the throat chestnut. Its habits and distribution are similar to those of the common species, but it makes longer flights after insects and has a more powerful voice. It feeds on wasps, bees and other insects. The snap of its mandibles, as they close on a victim, may sometimes be heard from a distance of a dozen yards.

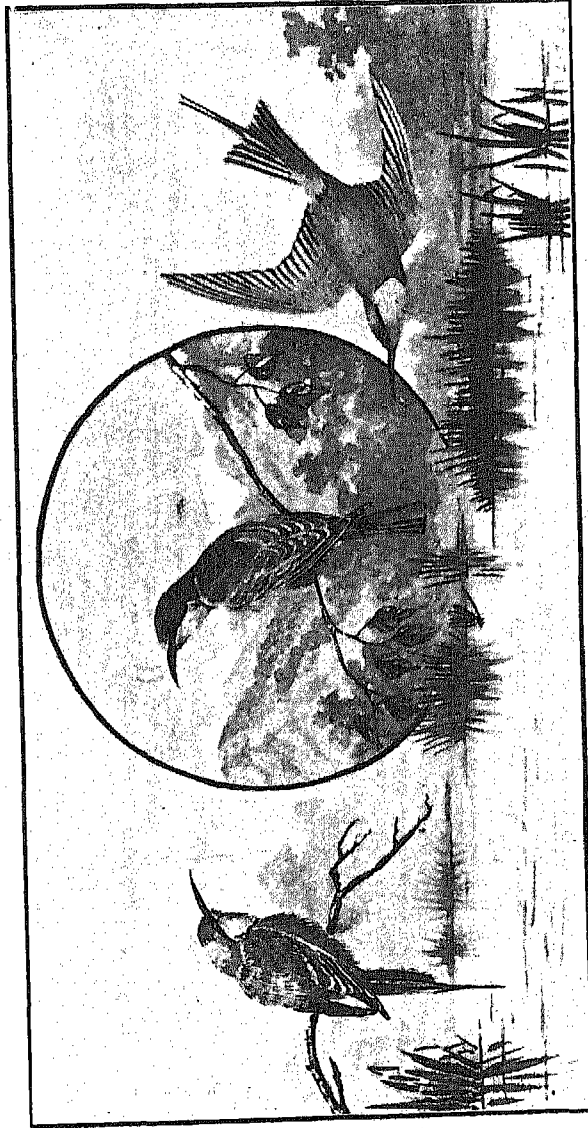
A bee-eater that visits the north-western parts of India in summer is the blue-cheeked species (*M. persicus*). As regards size and appearance, this resembles the blue-tailed species, but the tail is green and the forehead white.

The bee-eater that one sees hawking insects over the lakes of Kashmir is the European bee-eater (*M. apiaster*). This beautiful bird, which is intermediate in size between the blue-tailed and the common species, has the chin and throat yellow with a black gorget. The crown, hind neck and back are chestnut. It breeds in Kashmir. Its habits and those of *M. persicus* are like those of the common bee-eater.

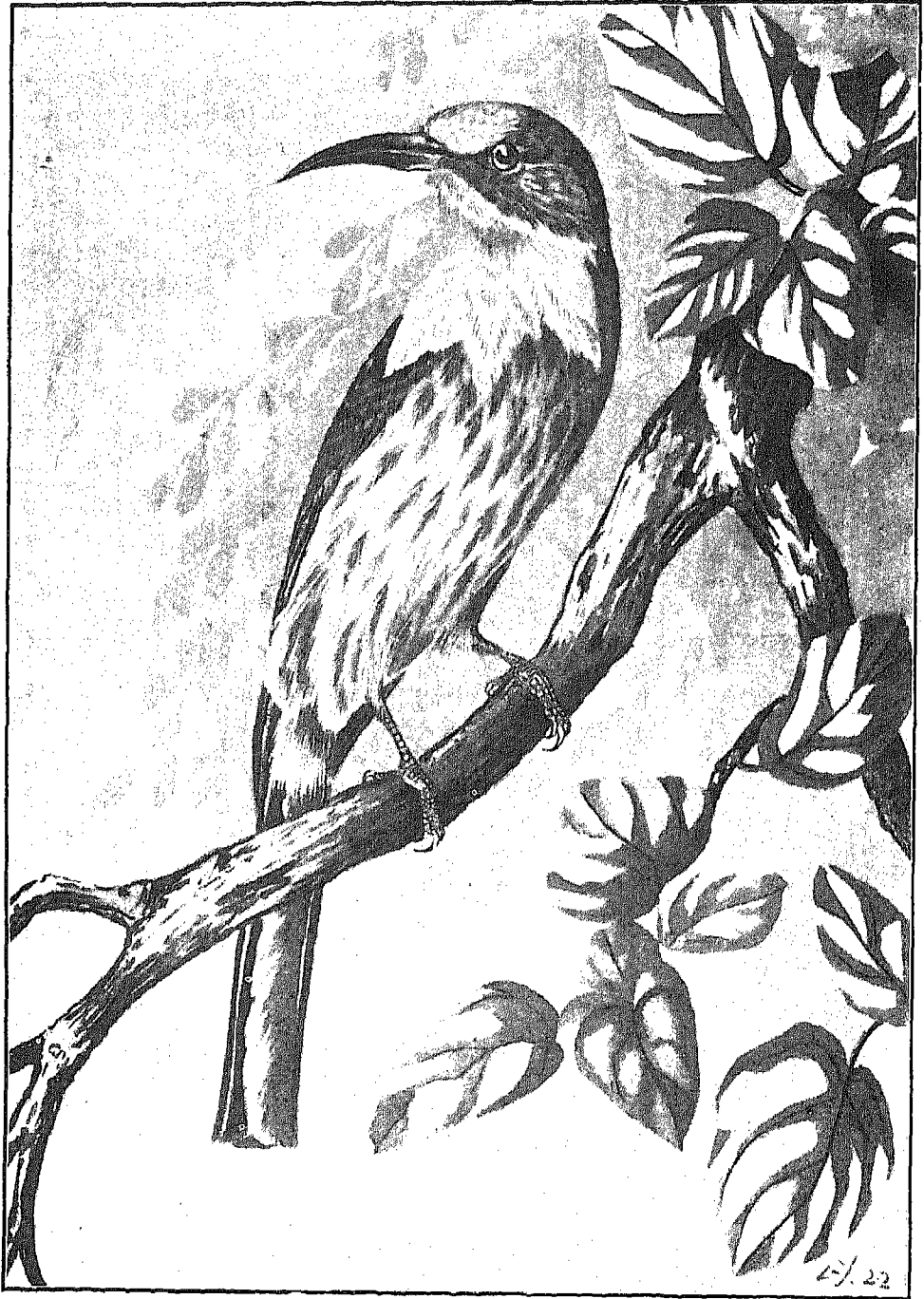
A small bee-eater, coloured like the European bee-eater, save that the gorget is chestnut instead of black, of which the tail feathers are all the same length, is the chest-nut-headed bee-eater (*Mellittophagus swinhoii*). This bird is found sparingly in South India, Ceylon, Burma, the Andamans and the lower Himalayas. It affects forests and shady streams.

In conclusion, mention must be made of two large bee-eaters which are respectively fourteen and thirteen inches in length, namely, the blue-bearded bee-eater (*Nyctiornis athertoni*) and the red-bearded bee-eater (*N. amictus*).

The tail feathers of these birds are all the same length. Both species are characterised by having the feathers of the throat and breast elongated, whence the epithet "bearded." The beard is light blue in the former species and scarlet in the latter. The blue-bearded species occurs in the lower ranges of the Himalayas as far west as Dehra Dun and in Burma. The red-bearded form lives in Tenasserim. The habits of both these birds resemble those of the common bee-eater.



CHESTNUT-HEADED BEE-EATER (*MELITTOPHACUS SWINHOII*) IN CENTRE.
COMMON INDIAN BEE-EATER (*MEROPS VIRIDIS*) AT SIDES.



BLUE-BEARDED BEE-EATER (NYCTIORNIS ATHERTONI).

VI.—Kingfishers.

Kingfishers are birds that feed chiefly (in many cases entirely) on fish, which they catch by diving into the water. The bill, which is very large for the size of the bird, constitutes an efficient organ for the seizure of the finny prey of its possessor. It is both long and stout. The legs are very short. The tail is never long. Kingfishers seem never to walk; thus there is no need for them to have strong legs, and a long tail would impede diving operations. Kingfishers are what are technically known as highly-specialised birds. That is to say, they are of unusual build, of build adapted to the peculiar manner in which they obtain their food. There are many kinds of kingfishers, but all are constructed on the same lines—those of the familiar kingfisher of England. This bird is also common in India, most Indian specimens are smaller than those found in Europe, in consequence some ornithologists have made a different species of them, calling this *Alcedo bengalensis*, the name for the European form being *Alcedo ispida*.

Anyone can identify at first sight a kingfisher as such. It is not, however, so easy to say to what species any particular specimen belongs. Eighteen different species of kingfisher occur in India—nineteen if the smaller Indian form of the common kingfisher is considered to be a separate species. Ornithologists have divided these into nine genera. A genus is a collection of animals which bear a general resemblance and which are believed to be related to one another. It is possible to divide up most genera into groups, such that all members of each group are almost exactly alike—each of these groups forms what zoologists call a species. Thus it is that every bird and beast bears a double name, the first part of this denotes the genus and the second the species to which the individual that bears it belongs. To take a concrete case; the common house crow of India and the larger black crow are both held to belong to the genus *Corvus*, but as they clearly differ in appearance they are deemed to belong to different species of the genus *Corvus*, and the house crow is called *Corvus splendens* and the big crow or corby is called *Corvus macrorhynchus*.

Sometimes the members of a widely-distributed species fall into local races, each distinguished by its own peculiarities. In order to indicate this, the modern tendency is to divide up species into sub-species and to give most birds and beasts a treble name, the three parts representing the generic, the specific and the sub-specific name. Under this nomenclature the common kingfisher of Europe is called *Alcedo ispida ispida*, while the smaller Indian form is known as *Alcedo ispida bengalensis*.

Personally I am not in favour of what is called the trinomial nomenclature, because it is cumbersome, a tax on the memory and of

very little use. If we know that the common kingfisher of Bengal is a small race we know that all the common kingfishers we see there belong to this race, and so there is no need to give it three names.

However, I fear that the trinomial nomenclature will replace the present binomial one unless field naturalists make a very firm stand against the innovation.

The reader will naturally ask "Who is responsible for the proposed innovation?" The answer is "The professional ornithologists in England." There are so few species of birds in England and the habits of these are so well known, that English ornithologists find themselves idle, and Satan finds work for idle hands. He has found for the cabinet ornithologists of England (who are mostly out of work) the congenial task of tinkering with birds' names and generally changing ornithological terminology. These gentlemen resort to the South Kensington Museum and amuse themselves by dividing up Indian and other foreign birds into sub-species, to the great annoyance of everyone except themselves. The standard book on Indian birds is being revised and the trinomial nomenclature is being adopted in the new edition.

The result is that the name of nine out of every ten Indian birds is being changed, so that for the next ten or twenty years there will be great confusion—field naturalists will often be puzzled to know what particular bird is being described. Eventually, after a long period of tribulation every one will get used to the new nomenclature; then Satan will again arise and cause some ornithological pedant to discover that the nomenclature again needs reorganisation!

But let me leave this unpleasant subject and return to the beautiful kingfishers, who pursue their avocations quite unaffected by the way in which they are being re-named.

The common kingfisher (*Alcedo ispida*) is a small bird, not much larger than a sparrow. The head is banded black and blue and has on each side a white and a rusty-red patch. The waistcoat is rusty red and the rest of the plumage is pale blue—very bright on the back. The feet are coral red and the bill is black. This bird is found throughout Europe and Asia.

It ascends the Himalayas up to 5,000 feet and is the commonest kingfisher on the lakes of Kashmir.

Its usual habit is to take up a perch on a branch or other point of vantage—in Kashmir the prow of a house-boat is a favourite spot—overlooking water. Thus it squats—the head half buried in the shoulders, but now and then bobbling up and down as if it were on springs—looking rather like a Blue Hungarian bandsman in a uniform several sizes too large for him. When it sees a fish in the water below, it dives, becomes completely submerged for a second or two, and then emerges, often with a small fish held crosswise in the bill. The king-



THE COMMON KINGFISHER (ALCEDO ISPIDA.)

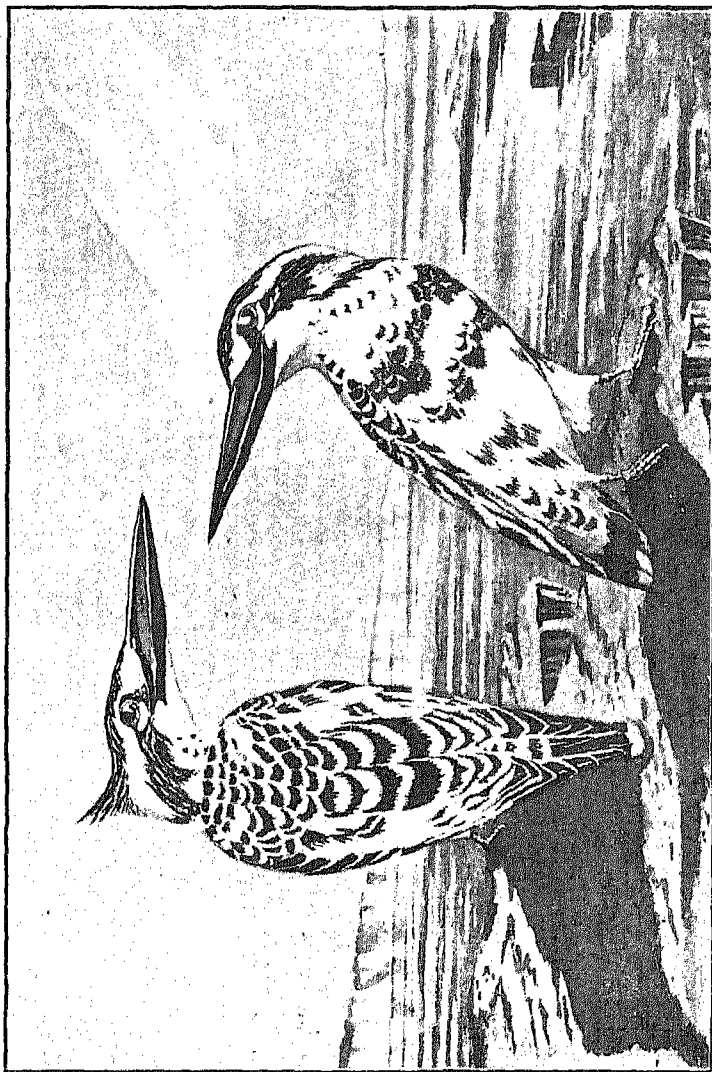
fisher next flies to a perch with this and, having stunned it by battering it against the perch, swallows it whole.

Sometimes, this bird hovers in the air and then dives into the water after its quarry. It has a peculiar screaming whistle which it utters frequently. It flies very rapidly for a short distance, and, as it speeds through the air, a few feet above the water, the brilliant blue on the back gleams in the sun.

Within Indian limits the genus *Alcedo* has blossomed forth into several varieties, to which Dr. Blanford has given the status of species.

There are two which have the feathers that cover the ears blue instead of rusty red. One of these occurs in Tenasserim and is called the Malay kingfisher (*A. menintig*), the other is known as Bevan's kingfisher (*A. bevanii*). An unusually small kingfisher with blue ears found in India or Burma is this variety. Then there are two larger forms—Blyth's kingfisher (*A. grandis*) and the broad-zoned kingfisher (*A. currysona*). The former may be distinguished from the latter by the well-defined bluey white transverse bars across the crown of the head. It is found in Sikkim and Bhutan and in the hills south of the Assam valley. In the broad-zoned kingfisher, which occurs in Tenasserim, the bars on the head are not nearly so well-defined as in Blyth's kingfisher. None of these birds are common and not one man in one hundred is likely to come across any of them. But everyone, no matter how unobservant, must see scores of the common kingfisher.

Let us now consider the *Ceryle* kingfishers. There are two of these in India, one confined to the plains and the other to Kashmir, the Himalayas, the hills south of Assam and those of Tenasserim. No birds are easier to identify than these. A large black-and-white kingfisher, in which the black takes the form of large spots and small bars is a *Ceryle* or pied kingfisher. If the bird is seen anywhere in the plains of India, Burma or Ceylon, it is the Indian pied kingfisher (*C. varia*). If it be in the hills it is the Himalayan pied kingfisher (*C. lugubris*). The latter is sixteen inches in length and the former about twelve, as opposed to the seven inches of the common kingfisher. The pied kingfishers despise perches from which to dive after fish. Their *modus operandi* is to hover in the air, kestrel-like, on rapidly plied black-and-white pinions, and then to close these and drop like a stone, into the water to secure a fish. More often than not the kingfisher checks itself in its dive and flies on to another place, presumably this happens when the fish on which it has its eye takes it into its head to descend into deep water. Pied kingfishers excavate the nest in the same way as the common kingfisher does. The plains species breeds from January to April and the Himalayan one from April to June.



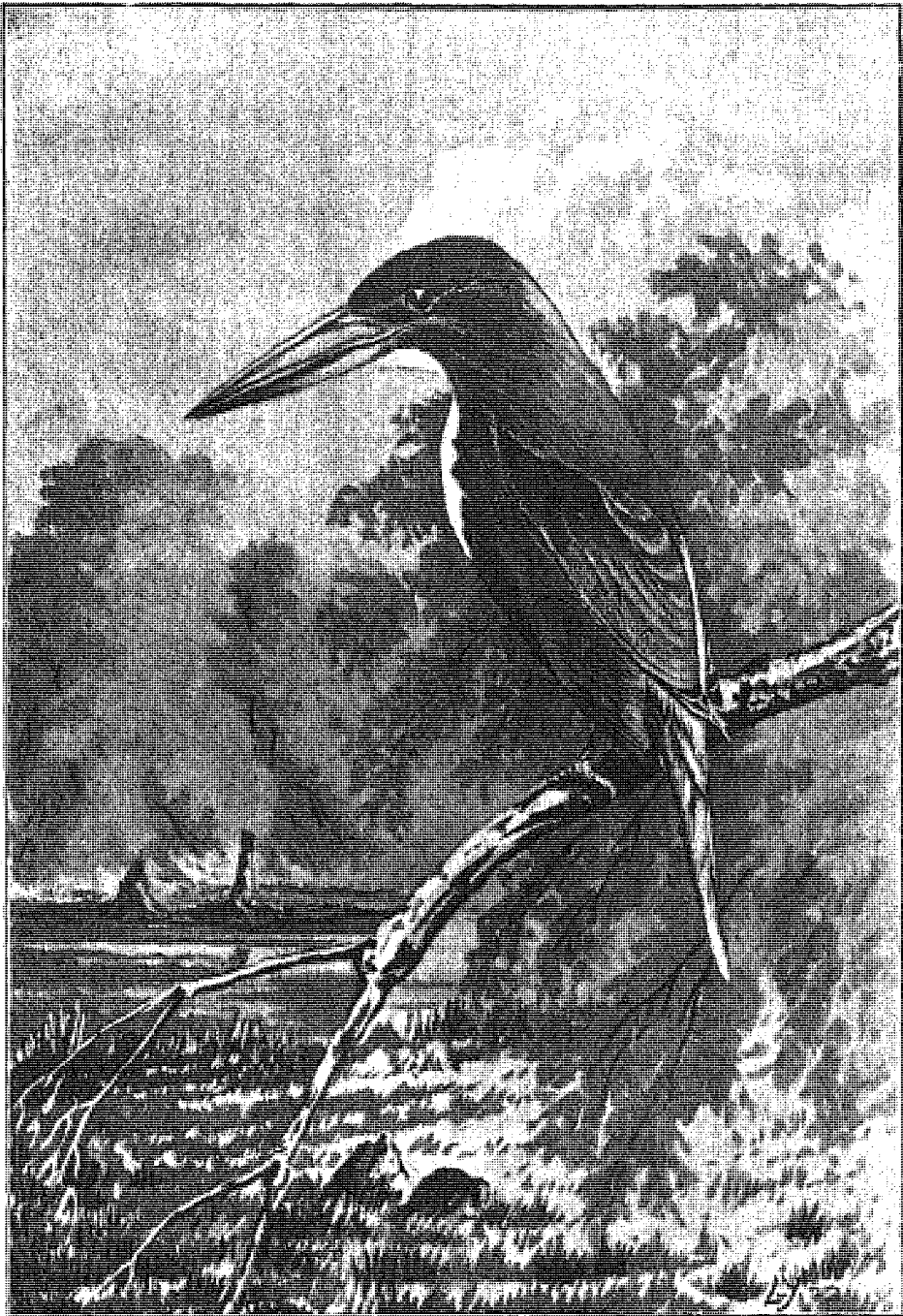
THE INDIAN PIED KINGFISHER (CERYLE VARIA.)

Let us now tackle the Halcyon kingfishers. Two of these occur in India. One of them, the white-breasted species, (*H. smyrnensis*) is perhaps the commonest kingfisher in India and it is certainly one of the most beautiful. It is to be seen everywhere in the plains of India, Burma and Ceylon, and it occurs in many gardens, for it has largely given up fishing and taken to an insect diet, which it secures after the manner of the roller, that is, by swooping down upon its quarry from above. Before discoursing on its habits, let me describe it. So distinctive is its colour that lengthy description is unnecessary, for which let us be duly thankful. The head, neck and the whole of the lower plumage are rich chocolate brown, except a very expansive snow-white shirt-front. The rest of the plumage is of varying shades of blue, with some black, chestnut and white in the wings. The white does not show when the bird is sitting, but when it flies, the white takes the form of a conspicuous wing-bar like that of the common myna. The bill is dark red and the legs coral red.

During flight it often utters a shrill scream, something like that of a woodpecker.

In the early morning it likes to perch on the topmost bough of a tall tree and give vent to a curious trill, difficult to describe but impossible to mistake when once recognised. I have often discovered the bird by this call.

As has been stated, this bird has largely given up fishing. It feeds chiefly on grasshoppers and other insects, and, it is said, lizards. It is often found in gardens and other places at a distance from water. Its nesting habits are similar to those of the kingfishers already described, but as it feeds little on aquatic organisms, the nest is often excavated in a bank at a distance from water. At least one pair nests every year in one of the artificial mounds in the Lawrence Gardens at Lahore. I came across one nest in a mound in 1922 and another in the bank of a small pond near Lahore. The latter was found in July and contained five young birds ready to fly. We dug them out, to the disgust of their parents, and photographed them; but two of them defeated the photographer by flying away just as he was about to open the camera shutter. No sooner had he completed the operation than two more flew away, leaving the fifth, who was too young to fly, looking very disconsolate. We managed, after much ado, to recapture three of the fliers (the fourth was too strong on the wing, so we had to leave him). We put these four back in the nest. It is almost certain that none of these youngsters had left the nest before we took them out, yet the four eldest flew quite well, without having been taught. Flying is an instinctive act with birds, just as swimming is with ducklings. For this reason I find it difficult to write with toleration about the nonsense that appears in some so-called natural history books



THE WHITE-BREASTED KINGFISHER (*HALCYON SMYRNENSIS*.)

that go in for lengthy descriptions of the lessons in aviation given by parent birds to their young.

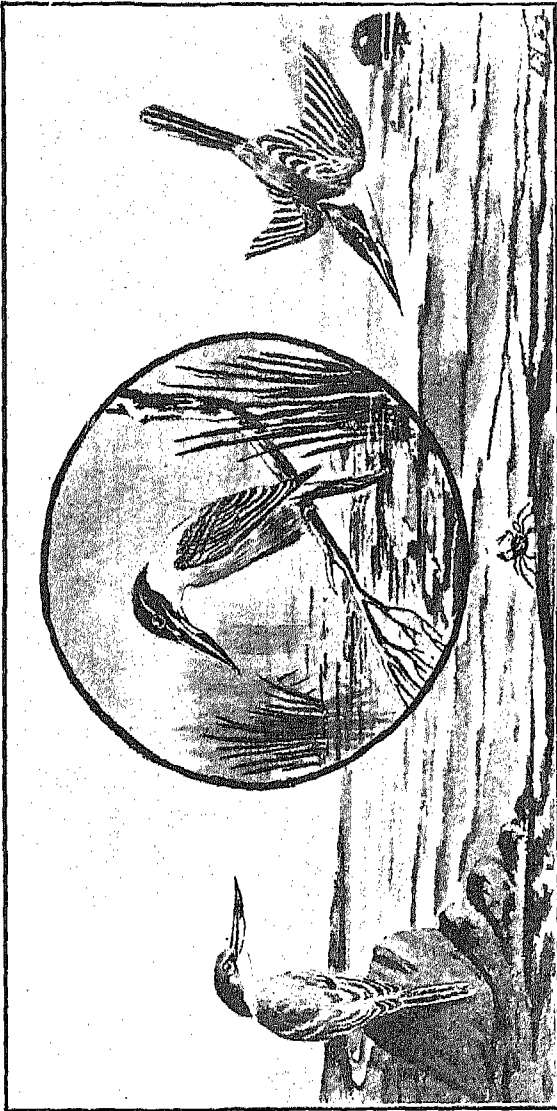
The other Halcyon kingfisher is *Halcyon pileata*—the black-capped kingfisher. As the name implies, it has a black cap. This is separated from the blue shoulders by a broad buff or white collar. This bird has a white shirt-front and wing-bar. By these signs it may be distinguished from all other kingfishers. It lives on crabs and fish and dwells in the Sunderbunds and on the coast of Burma. It seeks its quarry chiefly in salt water, but sometimes fishes in freshwater streams. As this species is of somewhat limited distribution it can scarcely be called a common bird in India. Of the kingfishers already described only four, namely the common, the two pied, and the white-breasted species are really common. There is yet another which, being abundant in the vicinity of Calcutta, should, I think, be included in the list. This is the brown-headed stork-billed kingfisher (*Pelargopsis gural*). This fine bird is nearly as large as the Himalayan pied kingfisher, attaining, as it does, a length of fifteen inches. The head is brown, the neck and lower parts are brownish yellow or buff, the back is blue and the wings and tail are greenish blue, with a little black in them. This bird fishes in freshwater streams. It has a peculiar plaintive call, which sounds something like *pio*, repeated several times. It ranges from the United Provinces to Siam and Cochin China to the east and Ceylon to the south. It is rare in the western parts of its range, but I noticed it on several occasions in the Pilibhit district.

There is a salt-water variety of the stork-billed kingfisher, which is known as the brown-winged kingfisher (*P. amauroptera*). This may be distinguished by its yellow head and brown wings and tail. It ranges from Bengal to Tenasserim on creeks and tidal rivers.

The *Pelargopsis* kingfishers of the Nicobar Islands are intermediate as regards colouring between the stork-billed and brown-winged races, having the head yellow and wings and tail blue. Accordingly Dr. Blandford has made a separate species of this variety and called it the Nicobar stork-billed kingfisher (*P. leucocephala*).

There are several other kingfishers found in India, but, as these are not common and of limited distribution, it does not seem necessary for me to deal with them at length. At the risk of making this article rather like a shop catalogue, I will mention some of them. It is this wealth of species that makes it so difficult to write a popular but comprehensive book on Indian birds. In England, where there is one cuckoo, one swallow, one kingfisher, this is child's play!

The Indian three-toed kingfisher (*Ceyx tridactyla*) occurs in the forests of Lower Bengal and the parts of India east of this, also rarely in South India and Ceylon. As the name implies, this bird has three toes; the kingfishers described above all possess four. The tree-toed



THE WHITE-COLLARED KINGFISHER (*SAUROPATIS CHLORIS*) AT SIDES.
 THE BROWN-HEADED STORK-BILLED KINGFISHER (*PELARGOPSIS GURIAL*) IN CENTRE.

species is a midget, being only $5\frac{1}{2}$ inches long. The small size and the orange red on the upper plumage are the marks by which it may be identified.

A kingfisher, about twice the size of the three-toed species, of light chestnut or cinamon hue, glossed with lilac, is the ruddy kingfisher (*Callialcyon lilacina*). This is found in the lower ranges of the Himalayas, and in Assam, Burma, the Nicobars and the Andamans.

A blue kingfisher, about ten inches long, having a broad white or buff collar, which lives in the Sunderbunds and to the east is the white-collared kingfisher (*Sauropatis chloris*).

In the variety found in the Nicobars the collar is not so well defined, hence that bird is known as Blyth's white-collared kingfisher (*S. occipitalis*).

In conclusion, mention must be made of a curious bird named the banded kingfisher (*Carcinectes pulchellus*), found in parts of Burma. Unlike the kingfisher described above, the male banded kingfisher dresses differently to his wife. He is banded with black and blue, she with black and rufous. No one seems to have placed anything on record regarding the nest of this bird. Here, then, is an opportunity for those who reside in Pegu. Does this bird burrow out a nest in a bank or does it make an open nest, as some of the Halcyon kingfishers seem inclined to do?

VII.—Parrots.

The appearance of a parrot is so distinctive that any member of the family is at once recognised as such, no matter to what species it belongs, or from what part of the world it comes. The comparatively short, massive, hooked bill, the soft, fat tongue and the thick, fleshy legs and toes, of which latter two point forwards and two backwards, are the most distinctive external anatomical features of "pretty polly."

India, although not so rich in parrots as in many kinds of birds, can boast of eighteen species. Fifteen of these have long, slender tails and are known as paroquets or parakeets. As the prevailing hue of the plumage of these is green, they are popularly called green parrots. Green parrots are found everywhere in India, except in the higher mountain ranges, and are, in all parts of the country, common birds. The long-tailed parrots of India belong to the genus *Palaeornis*, which occurs throughout Southern Asia and tropical Africa.

The fifteen species of Indian green parrot fall into three groups, the large, measuring more than 19 inches, the small, measuring less than 15 inches, and the medium, the length of which is about 17 inches. According to the *Fauna of British India*, there are seven large, five small and three medium-sized species of paroquets. As four of the

large and two of each of the others are obviously geographical races of one species, I should prefer to describe the Indian paroquets as falling into eight species.

The seven large species are, the Indian, the Burmese, the Ceylonese, the Andaman paroquets (which are really four races of one species) the Andaman, the Nicobar species, (which, again are races of a single species,) and Blyth's Nicobar paroquet. The small forms are the western and eastern blossom-headed paroquets—geographical races of one species, the blue-winged, red-breasted and Layard's paroquet. Those of medium size are the rose-ringed and the slaty-headed and Burmese slaty-headed paroquet; the last two again, are local forms of a single species.

As all the green parrots have the same habits, it will suffice to describe those of one species. Let us then consider those of the widely-distributed group of large Indian paroquets.

The large Indian paroquet (*Palæornis nepalensis*) is found throughout Northern and Central India. It extends as far south as Kandesh. Its eastern limits cannot be fixed with precision, because in Sikkin, Assam and the Sunderbuns it runs into the Burmese species, with which it interbreeds freely, producing crosses which are intermediate in appearance between the two species.

The large Indian paroquet, which Jerdon styled the Alexanderine parakeet, is, like all the Indian green parrots, a very handsome bird. In length it measures 21 inches, of which the flowing tail accounts for a trifle over 12. The prevailing hue of the plumage is rich green, that of grass in England after an April shower. This green is washed faintly with grey on the head, blue on the middle of the tail, and yellow at the tip of that appendage. There is a large deep-red patch, considerably longer than it is broad, on each wing. This peculiar wing-patch is a feature of several of the paroquets. The male has a beautiful rose-pink collar round the back of the neck (or rather the head), which is met at each extremity by a broad black band that runs to the base of the beak. The bill is deep red and the eye yellow.

The Ceylon variety, which is 19 inches long, is known as the large Ceylonese paroquet (*P. eupatria*). The black bands running from the pink collar to the base of the bill, technically called mandibular bands, are narrower. The Burmese race—the large Burmese paroquet (*P. indoburmanicus*) which is 22 inches long, has, like the Ceylon race, narrow mandibular bands. The green in the plumage is brighter and the throat is tinged with yellow. The Andaman race—the large Andaman paroquet (*P. magnirostris*) is 23 inches long. As the scientific name denotes, the bill is very large. The wing patch is of brighter red, and there is a narrow blue collar above the pink one. Traces of such a blue collar occur in some Burmese birds.

These slight differences in the four races of large green paroquets are due to the fact that the birds do not migrate, so that the individuals which live in one part of the country have no opportunity of mating with those of distant parts; in consequence local peculiarities, such as the blue upper collar, are not swamped by their possessors breeding with individuals which have no such collar and live at a distance.

The large Indian paroquet feeds on grain and fruit, and, in places where it is numerous, does much harm to the crops. A flock of a hundred or more, each member of which will break off half a dozen or more heads of corn in a day, destroys a considerable percentage of the produce of the fields that the flock visits. It is to stop, as far as possible, the depredations of parrots, deer and the many other grain-eating creatures that the Indian cultivator finds it necessary to erect a *machan* in the middle of his field. In this he spends the greater part of the day and night from the time that the grain begins to form until it is harvested.

The Indian gets something of his own back by capturing large numbers of young parrots and selling them for a few annas as a cage bird. Verily are the sins of the parents visited on the children, for most of these caged parrots are taken out of the nest before they have begun to levy toll on the ripening crops. These unfortunate birds are kept in tiny iron cages in which they are so cramped that they would die but for the fact that they are able to get sufficient exercise to keep them in fair health by climbing about the inside of their prison, beak over claw, and by standing on the solitary perch bending back the neck and wagging the head from side to side in such a way that one cannot understand why they do not fall off the perch from giddiness! Those who keep parrots are fond of them and are not intentionally cruel, but they often forget that the little metal cages in which parrots are confined become veritable infernos when hung out in the sun.

Indian paroquets can sometimes be taught to talk and to imitate sounds, but as a rule they are not good talkers or mimics.

Thanks to the large number that are taken captive, green parrots are not such serious pests as they would be were not their numbers kept down in this way, but they are still a scourge in many parts of the country and the agricultural departments of the various Governments might with advantage consider the advisability of taking steps to thin out some species. As their feathers form a pretty decoration for a woman's hat, some parrots might be shot and sold for this purpose to milliners in countries where bird protection is not carried to extremes, as it is in England where the Government is in the habit of yielding to the clamour of faddists!

The flight of green parrots is swift and as straight as the proverbial die. As they dash overhead in noisy flocks they look like living

emeralds. Green parrots nest in holes, usually in trees, occasionally in buildings. If they can find a suitable ready-made cavity they utilise this, otherwise they scoop out a nest-hole by means of the powerful bill. Sometimes squabbles over nest-holes arise between parrots and mynas. In such cases the mynas usually triumph, owing to their pertinacity, which is often more than a match for polly's superior bill-power.

Courting paroquets go through the most absurd performances, in which head-tickling plays a prominent part. From two to four white eggs are laid. Green parrots lay their eggs in any of the first six months of the year. In Northern India most eggs are laid in February. Both cock and hen take part in incubation.

The red-cheeked paroquets cannot be numbered among the common birds of India, because they are confined to the Andaman and Nicobar islands. The red-cheeked Nicobar paroquet (*P. erythrogeus*) is found only in the Nicobars and the red-cheeked Andaman paroquet (*P. tytleri*) occurs in the various islands of the Andaman group. They are distinguished from all other Indian paroquets by the light-red cheeks. The two are geographical races, the chief distinguishing feature being difference in size: the Nicobar birds are 19 inches long, those of the Andamans vary from 15½ to 18½.

Blyth's Nicobar parrot (*P. caniceps*) is peculiar to those islands. It is the largest of the Indian paroquets, measuring 24 inches. The forehead is black in both sexes.

The medium-sized paroquets are all common birds. The rose-ringed paroquet (*P. torquatus*) is one of the most abundant birds in India. It is found throughout India, Ceylon and Northern Burma, ascending the hills to elevations of about 3,500 feet. It is a small edition of the large Indian paroquet, measuring 16½ inches, but there are no red wing patches, and the pink collar and black mandibular bands of the male are thinner than those of the large paroquet.

The slaty-headed paroquets are characterised by the bluish slaty head. The cocks alone display red wing patches. The slaty-headed paroquet (*P. schisticeps*) is the common green parrot of the Himalayan hill stations. Its range is from Murree to Bhutan. East of this it is replaced by the Burmese slaty-headed paroquet (*P. finschi*). This is a geographical race characterised by the grey of the head being paler, the shoulders being tinted with yellow and the tips of the tail feathers having the appearance of much-soiled linen.

Of the small paroquets only two are entitled to a place among the common birds of India. These are the western and the eastern blossom-headed forms; as we have noticed, they are geographical races of a single species.

The western species (*P. cyanocephalus*) is a very pretty little bird, measuring 14 inches, considerably more than half which is tail. Owing to its handsome appearance and comparatively sweet call, it is very commonly caged. The head of the cock is red with a rich blue bloom on it, which gives it the appearance of a ripe plum. There is a black collar running from the base of the bill round the neck. Below this is a pale green collar round the back of the neck. There is a red wing-patch. The hen has the head blue grey, with a bloom on it. In place of the black and green collar is a yellow ring round the neck, gradually expanding forward till it becomes a patch covering the throat. This bird occurs all over India and is found at all elevations up to about 5,000 feet. In Eastern Nepal, Sikkin and Assam it merges into the eastern race (*P. rosa*). This has the head paler red, almost pink, but with a bloom. The head of the hen is paler than that of the western form and the yellow collar is less well defined. The blue-winged paroquet (*P. columboides*) is confined to the forests of the Nilgiris and the west coast, south of Bombay. The flight feathers of the wing are mainly blue.

The red-breasted paroquet (*P. fasciatus*) occurs in the Eastern Himalayas, Assam and Burma. The throat and breast are faded red, tinged with blue in front.

Layard's paroquet (*P. calthropæ*) is confined to the hills of Ceylon. It is only 12 inches in length. It has a grey-blue cap; the forehead and cheeks are bright green.

A tiny short-tailed parrot, less than eight inches long, that visits Tenasserim in summer, but is found in no other part of India, is the little Malayan parrot (*P. incertus*).

We have next to consider the Indian loriquets, of which there are two species or races—the Indian loriquet (*Loriculus vernalis*) and the Ceylon loriquet (*L. indicus*).

Although many of us have never observed loriquets in the wild state, we have all seen them in cages, and have been amused at the way in which they sleep hanging from the perch, head downwards.

They are midgets, measuring less than six inches, and are usually known as love birds. They are sometimes used by fortune-tellers to tell fortunes of people. The soothsayer has a number of leaflets, on each of which a "fortune" is printed. These are neatly folded and placed side by side, in a box. After the fee has been paid, the loriquet picks out one of these and, hands it to the seeker after forbidden knowledge.

The Indian loriquet is a grass-green bird, with a crimson rump, a blue patch on the throat and some blue on the under-parts, including the tail. The Ceylon loriquet has a crimson cap. This species is confined to Ceylon. The Indian species is curiously distributed, being found

in the south-western parts of India, the Eastern Himalayas, Assam and Burma. Loriquets are birds of convivial habits and are devotees of the flowing bowl in the form of the juice of the cocoanut palm. They are said often to be captured in a state of intoxication after imbibing that liquid!

Their breeding habits are similar to those of the paroquets.

VIII.—Swifts.

Swifts are birds in which flight has been brought to as near perfection as seems possible in this world. The whole anatomy of the swift is regulated so as to make the bird a perfect flying machine. Everything has been sacrificed to this. The legs are so small and feeble that



THE INDIAN CRESTED SWIFT (MACROPYX CORONATA.)

they cannot support the bird, much less enable it to walk. When a swift wishes to move from place to place it is compelled to use its wings, when it wants to rest it has to betake itself to its nest or to hang on to some object by means of its toes. In many swifts all four toes are directed forward and their only use seems to be that of hooks by which the bird can hang on to a solid object. Although the legs are not suitable for walking or hopping, the toes have considerable grasping power. The wings are immense for the size of the bird; they are long and narrow and end in a point. The bird seems to fly by whipping the air with the ends of its wings. In this respect swifts differ from swallows. You can distinguish a swift from a swallow in the air by simply watching the motion of the wings. If these open and shut as though they were a pair of scissors cutting the body, the bird is a swallow, if, on the other hand, they do not close up to the body during flight, but whip the air so that the flying bird has the shape of an anchor with enormous flukes, then the bird is a swift. It may be mentioned that swifts and swallows, although they are of the same build, are not nearly related. Their likeness is due, not to blood relationship but to the fact that they obtain their food in the same way. Swallows are passerine, that is to say perching, birds and as such have three toes directed forward and one backwards, so that they can grasp a perch easily, and the muscles of the legs are so arranged that, when they are relaxed, the foot grasps a perch firmly. It is when the bird wishes to relax its hold that it has to put forth an effort. This explains why birds do not fall off the perch when they are asleep. In some swifts the toes are all directed forward; in the species where one or two of the toes point backwards these are so weak that they cannot grasp a perch firmly. In this family the feet have been sacrificed at the expense of the wings. Speaking generally, Nature is an economist and does not allow her creatures luxuries. It is not necessary for swifts to walk, so Nature has given them weak feet; we noticed a similar phenomenon in the case of kingfishers. Swallows can and do perch, and often a score or more of them may be seen seated on a telegraph wire, but, as a set-off, their powers of flight are far inferior to those of swifts, which spend hours on end in rapid flight. Swifts feed on small winged insects, which they catch as they dash through the air. The bill is very short and very broad so that its possessor can snatch up its food when flying at a speed of one hundred miles an hour.

Even more wonderful than the pace at which swifts move is the way in which they are able to avoid obstacles. Probably everyone in India has noticed the extraordinary manner in which the swifts that have their nests in verandahs dash round the bungalow every evening threading their way in and out among the pillars of the verandah. Out of sheer love of the thing, the swifts zig-zag among the pillars, uttering

what Jerdon well describes as a shivering scream; they never collide with one another or with a pillar. Like most birds they become very lively about bed-time and fairly run riot during the hour before darkness sets in.

All species of swifts build the same kind of nest—a saucer-shaped structure, attached to a building, rock or cliff (in the case of palm-swifts to a palm leaf), composed of various materials, the sticky saliva of the birds being used to cement the materials together and to cause the whole to adhere firmly to the object to which it is attached.

Men of science divide swifts into three sub-families. In two of these—the *Cypselinæ* and the *Chaeturinæ*—the wings extend a long way behind the tail when they are closed; in the former the legs are always feathered, in the latter they are usually naked. In the third sub-family—the *Macropteryginæ*—the closed wings do not project beyond the tail. The members of this family are crested.

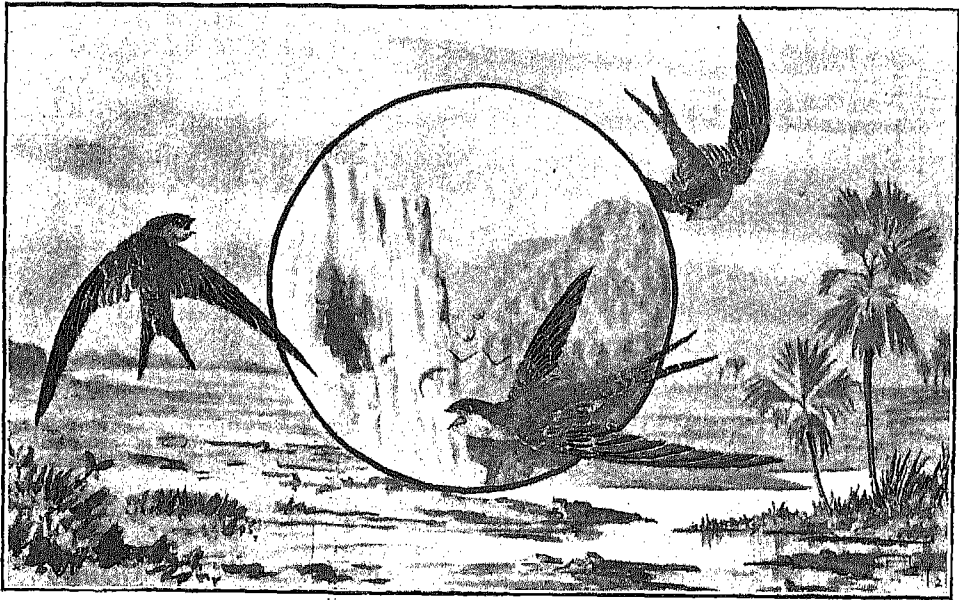
All three sub-families are represented in India, where there are no fewer than 21 different kinds of swift. Two of these are numbered among the commonest birds in India.

The common Indian swift (*Cypselus affinis*) is a mouse-brown bird with a broad white band across the rump and a white chin and throat. It measures $5\frac{1}{2}$ inches from the tip of the bill to the end of the short square tail. The wings are longer than the body and, when closed, project several inches beyond the tail; they are so long that they overlap when closed. This bird is common in most parts of India, west of Cachar. It occurs in Kashmir and the Himalayas up to elevations of some 7,000 feet. A small colony of swifts is attached to most *dâk* bungalows in Kumaun, and hundreds of them have their nests in the shops of the Landour bazaar at Mussoorie. In the plains they seem to prefer temples, mosques and ruins to inhabited buildings, but numbers attach themselves to bungalows and other dwellings. It must be remembered that swifts live in their nests throughout the year, using them as roosts.

The nesting season lasts from February to August, two broods being reared. The nests vary in size, shape and material. The average nest is saucer-shaped, four or five inches in diameter, and is attached to the rafter of a verandah or to the ceiling of a domed building. Some nests, however, are much larger. Hume describes two abnormal ones which he examined carefully, their measurements are "10 by 6 and $2\frac{1}{2}$ to 3 inches thick of grass, in which many feathers of doves, parrots, peafowl, sarus, duck, some little sheep's wool, and a bit or two of twine are all mingled. The bottom portions are a good deal cemented together by saliva, but the interior is by no means hard or smooth; others, again, are much smaller, globular and having the whole of the materials firmly agglutinated together. In the plains they are not

generally lined, but in the hills they often have a warm lining of grass and feathers." Each piece of material seems to be brought to the nest separately and the bird, having placed it, holds it for about a minute *in situ*, until the sticky saliva, which it has secreted, has had time to harden and fasten securely the addition to the nest. From two to four white eggs are laid.

The swifts of Shillong, Cachar and Burma are of darker hue and have the tail very slightly forked, in consequence a separate species has been made of this local race, called the Malay house-swift (*C. subfurcatus*). There are three other Indian swifts having the rump white, but none of them is common and they do not nest in houses. Two of them belong to the genus *Cypselus*; these may be distinguished from those already mentioned by the fact that the tail is distinctly forked, the outer tail feathers being $1\frac{1}{4}$ inches longer than the median ones in the large white-rumped swift (*C. pacificus*), which occurs in Assam,



THE PALM SWIFT (*TACHORNIS BATASSIENSIS*) OUTSIDE. THE BROWN-NECKED SPINE TAIL (*CHAETURA INDICA*) IN CIRCLE.

Cachar and Burma, and $\frac{3}{4}$ inch longer in Blyth's white-rumped swift (*C. leuconyx*), which occurs in the Western Himalayas. The fifth white-rumped swift belongs to the genus *Chaetura*, to be described later.

Three *Cypselus* swifts of which the rump is dark like the rest of the back are sometimes seen in India. These are (1) the Alpine swift

(*C. melba*). This is $8\frac{1}{2}$ inches long and has a lot of white in the lower plumage. There are records of this bird nesting in India; (2) the European swift (*C. apus*). This is 7 inches long, there is much less white on the lower plumage; (3) the pale brown swift (*C. murinus*). This is a pale mouse-coloured variety of Number 2. The tails of all three are forked, the fork being about $\frac{3}{4}$ inch deep in Number 1, and 1 inch in Numbers 2 and 3. These latter are only winter visitors to India.

We must now consider the palm swifts, so called because they occur only where there are fan palms, to the under leaves of which they attach their nests. Wherever you see palms in India there are you almost certain to see some of these swifts. If you observe any of these birds anywhere you have but to cast your eyes about and you will then see some palms.

Palm swifts are small birds, a little over five inches in length; the wings are shorter and of more slender build than those of the common swift. Their powers of flight are, in consequence, not nearly so great.

As the plumage of the palm swifts found in Cachar and to the east is darker than that of those dwelling in the rest of India, ornithologists have the opportunity of indulging their species-manufacturing propensity and have made two species out of the Indian palm swifts, namely, *T. batassiensis*, the palm swift and *T. infumatus*, the eastern palm swift. Both are brown birds, paler below than above, with nothing to enliven their sombre plumage.

As everyone knows who has tried to climb a palm tree, the ascent is a difficult matter. No one but a professional toddy-tapper armed with his hoop cares to attempt the feat, the consequence is that, although I have long intended to do so, I have not yet secured the nest of a palm swift. I must, therefore, perforce fall back on Hume's excellent description.

"Palm swifts," writes he, "nest solely on the *tari* or toddy tree (*Borassus flabelliformis*). The large fan-shaped leaves of this palm get bent by the wind, and hang down so that the points of the leaves turn somewhat inwards; and it is to the under surface of that portion of the leaf which is bent inwards that the nest is attached. The bent portions of the leaf stand at an angle of from 40 to 70 degrees, so that the under surface becomes in fact the upper surface, and presents a sloping furrowed bank to which the nest is attached. In one of these furrows formed by the large plaits of the leaf, and always about the centre of this latter, a tiny watch-pocket shaped nest, composed of the fine down of the *Argemone mexicana* and other plants, or, in other cases, of fine feathers, cemented together by the saliva of the bird, is firmly glued. The actual pocket of the nest is rarely above $1\frac{1}{2}$ inch in circumference and $\frac{3}{4}$ of an inch in depth, but the back portion of the nest runs up the plait from 2 to $3\frac{1}{2}$ inches. It is a curious fact that while the rest of the

nest is pretty soft, just as in the case of the watch-pocket a piping is run round the edge. In one or two nests that I have seen, the birds have incorporated the soft petals of the white poppy (so largely grown in Behar, where this species is specially abundant) with the other materials of the nest.

As a rule only one or at most two pairs, are found breeding in the same tree: but I once saw a whole colony located in a single palm. Three, sometimes more, small white eggs are laid. The eastern palm swift, in the Naga and Garo hills where the people thatch their huts with two layers of palm leaves, often attaches its nest to the upper side of one of the leaves in the lower layer of the thatch.

The spine-tailed swifts are so called because the shafts of the tail feathers are stiff and project as spines a short distance beyond the web. Their wings are very long and pointed, and they are probably able to fly faster than any other birds. Their legs are devoid of feathers. They attach their nests to rocks. There are four Indian species. The white-necked spine-tail (*Chaetura nudipes*) is so called because, of a patch of white feathers in the back. This bird, which is eight inches in length, is found in the Himalayas.

The brown-necked spine-tail (*C. indica*) is a slightly larger bird. This occurs in Southern India, Burma and Assam.

The white-rumped spine-tail (*C. sylvatica*) is about five inches long. Its tail is very short and square and so it is not easy to distinguish from the common swift, unless held in the hand when its spiny feathers can be seen. It is a forest bird: although nowhere common, there is scarcely any forest land, whether in the plains or the lower hills, where it *may* not appear.

The grey-rumped spine-tail (*C. leucopygialis*) occurs in Tenasserim. The genus *Collocalia* is interesting as being that to which the edible-nest swifts belong. As has been stated, the saliva of swifts is very sticky and hardens immediately it is secreted, thus it forms an excellent cement. The edible-nest swifts, or swiftlets as they are commonly called, use very little extraneous material in nest construction, hence their nests stand in much the same relation to those of the ordinary swifts as buildings made of concrete do to those built of brick. The hardened saliva of edible-nest swifts, when it has dried, is a whitish substance having somewhat the appearance of isinglass.

There are five Indian species of these swiftlets; these vary in length from 4 to 5½ inches. The tail is slightly forked. These differ from other swifts in that the longest of the wing feathers is the second instead of the first. The nests take the shape of half-saucers. The Indian edible-nest swiftlet (*Collocalia fuciphaga*) is a dingy-looking bird. Its upper plumage is dark smoky brown, glossed with purple green on the wings and tail. The lower parts are lighter brown in hue.

This swiftlet occurs in the hills of South India, also in Ceylon, and, it is said, in the Western Himalayas. The nests are not good to eat, since they contain grass and feathers mixed with the bird's saliva.

The Himalayan swiftlet (*C. brevirostris*) has the rump of lighter hue than the rest of the upper plumage.

There are two other swiftlets having a pale band across the rump; these are found in the islands of the Bay of Bengal and on the coast of Burma. They are Hume's swiftlet (*C. innominata*) and the little grey-rumped swiftlet (*C. francica*). The former has the legs feathered; in the latter they are naked. The nests of the little grey swiftlet are composed entirely of the birds' saliva and constitute the edible birds' nests of commerce. As I have not had the opportunity of seeing any nests of this bird, and as they are worthy of description, I am again compelled to have recourse to the admirable Hume.

"I found," he writes, "the eggs in a cave on Little Button Island of the Andaman Archipelago on the 21st March, but I do not know whether they have a second brood. The nest, except just at its junction with the rock (where it is brownish), is composed of the most exquisite silvery white gelatine. Exteriorly the surface is compact and somewhat roughened in laminae, interiorly it is a net-work of the finest and whitest threads. The true nest, which is pure white, and in shape rather more than half of a shallow cup, is from 2 to 2½ inches broad, stands out from 1½ to nearly 2 inches from the wall, and varies interiorly in depth from little more than ½ to a full inch. The attachment films, and foundation below the true nest, both of which are brown, vary excessively according to the site chosen for the nest; in some they are almost wanting, in others the film extends for an inch on either side beyond the nest, and the foundation below the most projecting point of the true nest may be 1½ inches in depth.

"The edge of the true nest all round is blunt, like that of an ivory paper-cutter, and the sides gradually increase as they approach the bottom to the thickness of ⅜, or occasionally even ½ inch. Of course, the nests vary in outline, as well as in size and depth, but the line of the upper edge is generally more that of a horse-shoe than that of a segment of an oval or circle.

"I found the nests capriciously dotted about, *par preference* in the darkest corners (nowhere out of reach of the hand, for the cave is low), in places a couple of feet apart, in others a dozen clustered together within a diameter of less than this; as a rule each nest was separate and distinct but in a few cases I found two, or even three joined together."

This species also nests in places off the Aracan coast.

Horsefield's swiftlet (*C. linchi*), found in the Nicobars, the Andamans and other islands of the Bay of Bengal, is distinguished from the other swiftlets by the white abdomen.

The crested swifts differ so much from the other swifts that they are held to constitute a separate sub-family. The wings are short for those of swifts, the legs are short and are not covered with feathers, the tail is long and forked; the head is crested and the sexes differ in appearance.

They sometimes perch on a branch; the nest is attached to a horizontal branch of a tree, and only one egg is laid. Three species are found in India. We need, however, consider but one, because the other two occur within Indian limits only in the southern parts of Tenasserim. Their names are the Malayan crested swift (*Macropteryx longipennis*) and the tufted tree-swift (*M. commata*).

The Indian crested swift (*Macropteryx coronata*) is nowhere common, but may be seen in almost any well-wooded part of India, Burma and Ceylon. It is nearly ten inches long. The tail is deeply forked, the outermost pair of feathers measuring over five inches and the median ones less than two. When one holds the bird in the hand one puts it down as a swallow on account of the forked tail and comparatively short wings. A perky crest springs from the forehead and is usually erected when the bird is perched. In the cock the upper plumage is greyish brown, glossed with green. There is a narrow white eyebrow and a black patch at the eye, behind this a chestnut one.

The chin is pale chestnut, the breast grey and the rest of the lower plumage white. The hen lacks the chestnut markings.

This bird usually goes about in small parties. Its nest is very small for the size of the bird—a minute half-saucer, $1\frac{1}{2}$ inches in diameter, made chiefly of flakes of bark, cemented together and to the branch to which the nest is attached, by the bird's saliva. The bird breeds in the hot weather.

VIII.—Hornbills.

Hornbills must be numbered among the most extraordinary birds in existence. The larger ones are as grotesque as it is possible for a bird to be. The chief cause of their grotesque appearance is an excrescence on top of the bill which most species display. In some cases the excrescence is nearly as large as the bill itself. This casque, as the excrescence is called, appears to be of no use whatever to the hornbill. Of the species that possess it the young are for months without it, and some kinds of hornbill thrive very well although they have no casque. Modern zoologists are so enamoured of Natural Selection, and are so convinced of the severity of the struggle for existence among birds and beasts that it is rank heresy to assert that any organ which is not a survi-

val of a once useful one is not of life and death importance to its possessor. I cannot help this. I am a heretic. I refuse to bow the knee in the House of Rimmon; I decline to worship the golden calf of Natural Selection, or to take anything for granted. Men of science are always trying to shift the burden of proof on to the wrong party. He who asserts must prove. Those naturalists who assert that the casque, which has no apparent use, is a useful organ should demonstrate what the use is and explain how it is that young birds manage without it for the first few months of their existence and why the Malabar and Ceylon grey hornbills, which never develop a casque, have not been wiped out of existence.

If men of science were compelled to undergo legal training, we should find much less nonsense being talked in the name of science.

Fifteen species of hornbill occur in India. Europeans often call them Toucans. This is incorrect. Toucans have grotesquely large beaks, but they do not possess a casque. They are nothing but exaggerated barbets and are confined to South America.

Most of the Indian hornbills are denizens of forests; there is however one genus—*Lophoceros*—the members of which frequent gardens, groves and road-side trees.

This genus is divided into three geographical races, to each of which ornithologists have given specific rank. These are the grey hornbill (*L. birostris*), found in most parts of India, except Burma, Ceylon and the Malabar coast, the Malabar grey hornbill (*L. griseus*) and the Ceylonese grey hornbill (*L. gingalensis*), which respectively occur on the Malabar coast and in Ceylon.

As the grey hornbill is by far the commonest in India and as it is the one with the habits of which I am most familiar, I will first deal with this species at some length and then point out very briefly the characteristics of the other Indian species.

The grey hornbill is a bird about two feet long, the tail being as long as the head and body together. The bill is about four inches in length. The casque is about a third of the length of the bill and ends in a point, as shown in Mr. Levett-Yeats' illustration. As the name implies, the plumage is mainly grey—a rather pretty shade of brownish grey.

On the sides of the head it is washed with black. The abdomen is white, as are the tips of the tail and wing feathers. Each tail feather has a sub-terminal black band. The tail is somewhat graduated, the median pair of feathers being the longest and the outermost pair the shortest. The eyes are red. The wings are small for the size of the bird, and, in consequence, the flight is somewhat laboured, consisting of alternate vigorous flappings and sailings. The grey hornbill has a curious squeaking cry, like the sound emitted by some toys, and quite



TWO YOUNG GREAT HORNBILLS IN THE CENTRE
 It should be noted how the tail is erected and that there is no easque on the bill as yet.
 INDO-BURMESE PIED HORNBILL (ANTHRACOCEROS ALBIROSTRIS)
 On the sides are seen the male, left—female, right.

disproportionate to the size of the bird. Grey hornbills live chiefly on fruit, but they also eat bees and other insects. They often go about in small parties, which keep to trees.

The nesting habits of this and other hornbills are very curious, so curious that when they were first described they were disbelieved and regarded as myths, figments of the imagination.

Hornbills lay their eggs in natural hollows of large trees—silk cotton-trees (*Bombax malabaricum*) being often chosen. The opening that leads to the nest is generally not less than thirty feet from the ground.

Three or four eggs are laid. As soon as the clutch is complete, if not directly after the first egg is laid, the hen enters the nest and does not leave it until the young birds are ready to fly, or, in cases where there is a considerable interval between the laying of the first and the last egg, until the oldest youngster is ready to leave the nest.

As soon as she is inside, she and her mate proceed to close up the orifice of the nest, leaving a fissure just sufficiently large to enable the cock to insert his bill. The material used for closing up the nest aperture varies according to the taste of the owners of the nest. Horse-droppings, cow dung and mud are often utilised: only one of these is used in any one nest, but it is invariably mixed with the droppings of the birds.

Some individuals are said to use only their own ordure. I have not come across an instance of this.

The hen, when thus incarcerated, is entirely dependent on the cock for food. He is very assiduous in feeding her. He does not bring the food in beakfulls, but swallows what he collects and regurgitates this at the nest. I have never dissected a hornbill's neck, but this must have peculiar muscles to assist in the process of regurgitation. The gullet seems to take a spiral course, as when a young bird that I reared swallowed, the food as it was being swallowed could be seen passing downwards from side to side of the neck. The process of regurgitation is not effected without difficulty: there is a good deal of craning of the neck and shaking of the head before a morsel suddenly appears at the tip of the bill of the bird laden with food. The food brought consists largely of fruit—whatever fruit happens to be in season. The hornbills that I have watched brought chiefly pipal and banyan figs, jamun plums and dates.

Seven or eight regurgitations are usually made at each visit to the nest, but the number depends largely on the nature of the fruit.

I once saw a bird regurgitate 43 times! I watched this through glasses, and the food appeared to consist of small insects. A man who was watching fruit trees said that the hornbills were fond of the wasps that visited the fruit trees.



THE GREAT HORNBILL (*DICHOCEROS BICORNIS*).

The eggs take about fifteen days to hatch and it is not until the young are about four weeks old that they leave the nest. Thus the voluntary imprisonment of the hen, each year, lasts some seven weeks. When she emerges she presents a bedraggled appearance.

The young birds, during the first three weeks of their existence, are very noisy; their squeaks are distinctly audible at a distance of fifty or sixty yards. They seem to know by instinct when the cock is at hand with food, for, although he approaches very steadily (he is a very timid bird), they begin calling before he has alighted at the nest hole.

At the time the young birds leave the nest they are small editions of the adult; the grey of their plumage is paler and they lack the casque. The long tail is loosely inserted and comes out if pulled!

It can be bent upwards like that of a fantail pigeon without hurting the bird; indeed a young one that I reared used to sit with the tail almost touching the head. It is only by thus doubling up that they can fit into their very close nesting quarters without damaging the tail.

Only one brood is reared each year. Nesting operations begin in the last week of April.

The nesting habits of all the other kinds of hornbill are very similar to those of the grey hornbill.

The Malabar grey hornbill differs from the common grey species in having no casque and in having the tail back, glossed with green, instead of grey. The outer pairs of tail feathers are white at the ends.

The Ceylonese hornbill also lacks the casque; the tail is blackish brown, except the outer three pairs of feathers which are largely white.

The great hornbill (*Dichoceros bicornis*) is an immense bird, being nearly four-and-a-half feet long. The very massive bill is $10\frac{1}{2}$ inches in length. The casque is nearly as long and covers the basal half of the beak and the whole head, so that this hornbill appears to be wearing a cap made of horn. The bill and casque are yellow tipped with red. The posterior part is black in the male and red in the female. The eye of the cock is red and that of the hen white. These and the smaller size of the hen constitute the only external differences between the sexes. The plumage of both is the same. The upper parts, including the breast and wings, are black except for the neck, which is white like the lower parts. There is some white in the wing, which forms two bars when the wing is folded. The tail, which is fifteen inches long, is yellowish white, set off by a black-cross band about two inches from the tip.

This amazing bird is a denizen of forests: it is strictly arboreal in its habits. It feeds on fruit; it is said to toss into the air the fruit it picks and then catch it. Mr. E. V. Lucas describes a hornbill in the Zoological gardens as the best 'short slip' in Regent's Park. Its flight

is said to be so noisy that the sound it makes can be heard a mile away. This fine bird occurs in the Lower Himalayas, Assam and Burma and farther east. It is also found in the Western Ghats, south of Bombay.

Next to the grey hornbills the commonest ones in India are the smaller pied hornbills. Dr. Blanford makes two species of these which he calls the Malabar pied hornbill (*Anthracoceros coronatus*) and the Indo-Burmese pied hornbill (*A. albirostris*). The former is distinguished from the latter by having the outer tail feathers entirely white, those of the Indo-Burmese variety being white only at the tip. He, however, sub-divides the latter into two races, a larger 35 inches long which inhabits Northern India as far east as Cachar and south as Chota Nagpur, and a smaller ranging from Cachar to Cochin China. The smaller form measures 28 inches. The more correct view seems to regard the lesser pied hornbill as one species falling into three geographical races, the western, eastern and southern.

This bird is fairly common in the Terai, and most sportsmen must have come across it when they were shooting in that region. On one occasion when I was sitting in a *machan* in the Bahraich district waiting for the beaters to come up, one of these fine birds perched in the tree in which my *machan* was placed, as it did not notice me, it gave me an excellent opportunity of watching it.

The upper parts are black, glossed with green. The lower parts are white. There are two white bars in the wing, visible when it is folded. The middle pair of tail feathers is entirely black, the others are tipped with white. In the Malabar variety all the tail feathers except the middle pair are white. There is a patch of the bare skin round the eye; this is bluish black in the male and white in the female. The eye is reddish. The casque is a sausage-shaped structure, extending over the forepart of the head and the basal two-thirds of the bill. Its sides are convex in the northern races and concave in the Malabar race. The casque is black and yellow, the markings on it differing in the sexes. The habits of this species are similar to those of the birds described above, but it is said to eat fish and snakes as well as fruit. In 1921 one of these birds escaped from the Lahore zoo. When at liberty it consorted with the grey hornbills in the vicinity, but used to visit the zoo daily in order to eat its rations!

There are no fewer than nine other kinds of hornbill found in India, but these are mostly rare birds of limited distribution; therefore I shall give only a very brief account of them.

The one species in which the casque is well-developed is the helmeted hornbill (*Rhinoplax vigil*). The only part of India in which this is found is Tenasserim. It is about five feet in length, or rather the male is, he having a much longer tail than the hen. The chin, throat, neck and the middle of the back are devoid of feathers.

In the wreathed hornbills the casque is small. It is fluted and gives the base of the upper mandible the appearance of having been softened, forced into a sponge-cake mould and allowed to harden after it had taken the shape of the mould.

There are three species—the Malayan wreathed hornbill (*Rhytidoceros undulatus*) 45 inches long, Blyth's wreathed hornbill (*R. subruficollis*), 35 inches and the Narcondam hornbill (*R. narcondami*), 26 inches long. Apart from difference in size, the three species closely resemble one another. The males of all three are characterised by having some chestnut or rufous in the plumage, the rest of the feathering is black and white, the tail being entirely white.

The hens are black, except for the tail which is white. The Malayan wreathed hornbill ranges from Assam to Borneo, Blyth's from Burma to Borneo and the third species has been found only in Narcondam, an island of the Andaman group.

It is interesting to find in this family of birds, through which a unique nesting habit runs, examples of species in which the sexes are alike in plumage, those in which they differ slightly and those in which the difference is very marked. This is one of the many phenomena that demonstrate the untenability of the theory that sexual dimorphism is due to the greater need of the hen of protection from enemies. This theory is based on the supposition that the duty of incubation is undertaken mainly by the hen. In perhaps nine species out of ten the cock and hen sit turn about.

The rufous-necked hornbill (*Aceros nepalensis*) is a large hornbill, four feet in length, of which the sexes differ in appearance. Their colouring is not unlike that of the wreathed hornbills, except that the tail is black and white and the hen has some white in the wings. There is no casque, but the upper mandible has four chestnut-hued grooves on each side. This species occurs in the Himalayas, east of Kumaun and extends to Tenasserim.

The following are the other Indian hornbills described in the *Fauna of British India*.

The bushy-crested hornbill (*Anorrhinus galeritus*), found in Tenasserim, Tickell's hornbill (*Ptilolæmus tickelli*), found in Tenasserim.

Godwin-Austen's hornbill (*P. austeni*), found in Cachar and Manipur.

The long-crested hornbill (*Berenicornis comatus*), found in Tenasserim.

The hornbill family is interesting as illustrating the fact that there is no connection between the colouring of a bird's plumage and that of its skin, feet and bill. It often happens, as in the case of the hornbill family, that the latter assume brilliant and variegated colours, while the plumage displays very little colour. In the hornbill family the

plumage is either black, white or grey with an occasional patch of chestnut or rufous, but the bare patches of skin which appear in most species, and the casque and bill may exhibit any bright colour.

IX.—Hoopoes.

The hoopoes are usually considered to be related to the hornbills because both display certain anatomical peculiarities and there is some resemblance in their nesting habits. Both nest in holes and in both the hen alone appears to incubate and she sits very tight. Although the hoopoe does not itself diminish the size of the aperture leading to the nest, it is usually careful to select as a cavity, in which to deposit the eggs, one with a very narrow aperture. It is said that, from the time the last egg is laid until the young are ready to leave the nest, the hen hoopoe sits without interruption, never leaving the nest. This is probably correct, but I personally have not had the time to prove or disprove the assertion. To do so would involve continuous watching of a nest for about sixteen hours on end, and, even then, it might be necessary to place some distinguishing mark on the cock and hen, as they are alike in outward appearance. As hoopoes are fond of nesting in bungalows, anyone, with the time and patience and a confederate, could easily ascertain whether or not the hen ever leaves the nest during the period of incubation. In almost every bungalow in which I have lived a pair of hoopoes has reared up a family in the spring.

No bird is easier to identify than a hoopoe. A bird, about the size of a myna with short legs and long slender bill, that struts about the lawn probing for insects, worms and grubs, a bird of which the wings and tail are boldly barred with black and white and of which the head and neck are fawn coloured and which has a wonderful crest of the same hue, tipped with black, a crest which opens out like a lady's fan when the bird is excited or alarmed and whenever the bird alights after flight—such a bird can be none other than a hoopoe. This flies in undulations and when on the wing looks rather like a huge black-and-white butterfly.

Hoopoes are found all over India and Burma in both hills and plains. Dr. Blanford divides the hoopoes found in India into two species and expresses some doubt as to whether a third should not be constituted. The two species which he makes are the European hoopoe (*Upupa epops*) and the Indian hoopoe (*U. indica*). In the former, the fawn of the neck is rather paler and there is a little white in the crest or corona as it is often called, between the buff and the black tips of the feathers. The form occurs in Kashmir and the Himalayas, and in winter visits the plains. The Indian form is a permanent resident of all parts of India, except the Himalayas and the Punjab. As, however,

a large number of hoopoes found in the plains in summer have more or less white in the crest, they must be considered as hybrids. I would prefer to call the Indian form a local race of the European species. The Indian form has rather smaller wings than the European form, while the hoopoe in Burma has a wing intermediate in length. As the hoopoes that breed in the plains of India and in Burma do not migrate, they should, I think, be regarded as local races of the migratory European form.

The hoopoe nests from February to May in the plains of India, earlier in Ceylon and later in the Himalayas. The nest is in any kind of a hole in a tree or building. Into this is stuffed a collection of grass, straw, rags and any other soft material available. From four to seven eggs are laid. When opened out the nest smells unpleasantly. As has been remarked, the hen is a close sitter and the cock brings her food. Both parents feed the young ones; these, when being fed, utter a squeaking noise not unlike that made by a cycle pump when applied with the violence which Indians deem necessary to exert when inflating a tyre. Young hoopoes are miniatures of the adult; and usually show some fawn colour in the white of the wings. A second brood is often raised. Sometimes the second clutch of eggs is laid before the products of the first clutch are completely off the hands of their parents! It is scarcely necessary to state that hoopoes are among the commonest birds in India, one or more pairs of these fascinating creatures living in almost every Indian garden.

X.—Nightjars.

We have now to consider a group of birds having very large mouths. Birds that live on insects, which they capture in the air, have the mouth large, and very often a broad bill. The use of such a mouth is obvious: the larger the gape and the broader the bill the less is the need for extreme accuracy in making a snap at a flying insect.

Nightjars are birds that feed on moths and other insects, which they capture only between sunset and sunrise. The bill of the nightjar is an insignificant organ, being little more than a horny rim to the mouth. The mouth is so large that it can contain a hen's egg comfortably. This mouth is so curious and unbird-like that, centuries ago, someone assumed that it must be used by its possessor to milk goats! Dishonest domestic servants seized eagerly on this suggestion, because, if believed, it enabled them to charge the nightjar with the theft of the milk which they themselves had abstracted from their masters' goats. The credulous Pliny believed in the goat-milking propensities of the nightjar and so called the bird "*caprimulgus*"—the goatsucker—a name

which the bird retains to-day. It is said that the Italian country folk even now firmly believe that nightjars milk goats.

Nightjar, the other common name, is of course far more appropriate to this creature of the night that utters a curious jarring note.

Other local English names for the only nightjar found in Great Britain are dor-hawk, fern-owl, night-hawk, jar-owl and churn-owl. None of these names is good, because the nightjar is neither an owl nor a hawk. It is so called because its plumage is mottled like that of most owls and hawks. If it come forth in the day time it is promptly mobbed by the small birds, who doubtless consider it a kind of hawk. The epithet "fern" is applied to it because during the day it lies up among grass and bracken.

The adjectival "churn" is due to the curious call of the English bird which recalls the whirl of machinery. The Telegu name, which means frog-bird, is perhaps happier than any of the popular English ones.

Nightjars are spread all over the temperate and tropical regions of the earth. This being so it is scarcely necessary to state that the nightjar family is well-represented in India. No fewer than eight species are numbered among our birds. Before describing the more common of these it is necessary to say something about nightjars in general. They are more nocturnal than owls. During the day they sit on the ground, hidden by a bush or grass or undergrowth, and come forth as the shades of night fall. They seem to feed for two or three hours and again to rest until an hour or two before dawn when they treat themselves to an early breakfast. They are at rest long before the sun rises. They feed on moths, beetles and other flying insects. Their flight is silent like that of an owl. This silent flight is a feature of all night birds. When hawking insects the nightjar performs wonderful evolutions, hence its local English name—wheel-bird.

The flight of the nightjar is a subject over which many a naturalist has waxed eloquent. It combines grace and jerkiness in a wonderful manner. A nightjar does not usually fly for many minutes together. Between each circuit it rests on the ground, a stone or a broad branch, on which it squats lengthwise. Sometimes the bird flies slowly and jerkily, at others it dashes through the air with meteoric swiftness. Edmund Selous speaks of the glorious powers of motion of the nightjars. "One cannot see them," he cries, "without wishing to be one of them."

By way of general description let me say that nightjars resemble the common cuckoo in size and colouring. The general shape, too, is like that of the cuckoo, but with marked differences, to wit the head is flat, the gape very wide, almost splitting the head in two, the eyes are large, lustrous and dark, like, as Eha remarks, those of the heroine of

a penny-dreadful, the feet are small. I doubt whether the nightjar ever walks or hops.

The plumage is extremely beautiful: it reminds me of that of some moths. I have before me an article entitled "The Natural History of the Goat sucker" which was anonymously contributed to the issue of *The Universal Magazine* for June, 1780, in which is given a description of the nightjar's plumage so good as to be worthy of quotation at this distant time: "It is painted all over with an agreeable mixture of black, brown and grey or white iron colour, in a kind of streaks, spots and bars. . . . The tongue is small and placed low in the mouth, the legs are likewise small, scaly and feathered down to the toes. The middle toe is joined to those on each side by a membrane reaching to the first joint, and the inner edge of the middle claw is serrated as in herons." With this comb the nightjar keeps its plumage in admirable condition.

There is usually in the male a little white in the tail and a white wing-bar; in the female the white is replaced by buff.

Nightjars lay two or three eggs on the bare ground, open and exposed to view; nevertheless the eggs are not protectively coloured!

Perhaps only two of the Indian nightjars are sufficiently widespread and numerous to be entitled to a place among the common birds of the country. These are the common Indian and Horsfield's nightjars.

The common Indian nightjar (*Camprimulgus asiaticus*) is found all over India except in forests on the higher hills. In Burma it occurs as far south as Moulmein. It is much commoner in some parts of the country than in others. It is a familiar object at night-fall in the suburban gardens of Calcutta. It is the ice-bird of Europeans in India, so called because its cry resembles the sound made by a stone skimming over the surface of a frozen sheet of water. This call is heard chiefly during the cold weather. Curiously enough, the bird seems to become silent in the hot weather when it breeds. Most nightjars have two calls, and this species is no exception: its other call has been likened to the *cock-cock* often uttered by the crow-pheasant. In South India it breeds about March, in the North from April to July, and during the rains in Kandesh. It lays two eggs of which the ground colour is salmon pink, sometimes very pale; on this surface are faint purple blotches and brown spots. When held in the hand the common Indian nightjar can be distinguished from other Indian forms by the facts that its legs are not feathered to the toes and that it has black longitudinal streaks on the back.

These black streaks serve to differentiate it from Sykes's and Franklin's nightjars in which the tarsus is also almost naked.

Horsfield's nightjar (*C. macrurus*) is less addicted to gardens and human habitations than is the common nightjar; the latter sometimes comes into a verandah to hawk insects and will rest on a house-top. I

have never known a Horsfield's nightjar behave in this way, but apparently it used to be fairly common in Calcutta, for Jerdon wrote, "It is not uncommon about Calcutta gardens and shady places. I have flushed it in the Botanic Gardens at Calcutta." Nowadays the *sal* forests of Northern India are the places where this fine bird is most common. Sometimes when staying in a forest bungalow I have had my sleep disturbed by this noisy bird. The usual call is a series of loud, sharp sounds, exactly like those made when a plank is repeatedly struck by a hammer. This call appears to be uttered only when the bird is sitting. As it calls its tail vibrates and its wings are sometimes partially expanded. In order to call it likes to sit on the tip of an upright branch. When calling it sometimes, so to speak, turns on its axis. During flight it utters a low chuckle or churring sound, like that emitted by some owls. It begins to call about February and the call seems to coincide with the breeding season, which is from March to May. It often makes little sallies from its perch after some flying insect, just as a flycatcher does. It lays two eggs, which are coloured like those of the common Indian nightjar, but the ground colour is sometimes buff or very pale lilac instead of the more common salmon tint.

Horsfield's nightjar is found in the Himalayas and all over India and Burma, and its range extends to Australia. There are several geographical races or sub-species. There are a western pale form, a dark eastern one extending from the Eastern Himalayas, and a dark-winged form which occurs in South India and Ceylon.

Horsfield's nightjar is considerably larger than the common Indian species, measuring some eleven inches, as opposed to the nine-and-a-half inches of the common Indian species. Practically the whole of the leg is feathered. By this and by its larger size it may be differentiated from the other form when held in the hand.

Before passing on to the frogmouths it is desirable to say a few words about the other Indian nightjars.

The European nightjar (*Caprimulgus europæus*), which is a summer visitor to England, comes to India in winter and spreads over the northern part. Etawah is, I believe, the most westerly place at which it has been observed. The majority of the European nightjars that visit India in winter breed in Kashmir and more northern countries, but a few nest in the Himalayas. The nightjar is very like Horsfield's in appearance, but the white wing-bar is shorter and the call is quite different, being a peculiar whirr. The Asiatic form of the European nightjar constitutes a smaller, paler, greyer race.

Franklin's nightjar (*C. monticola*) has, like the common species, legs almost devoid of feathers, but has no black streaks on the back. This species is found in the forests of the Himalayas and of Northern and Central India. Its curious call is as difficult to describe as it is easy

to identify. It is a loud, harsh *tweet* which may be likened to the harsh call of the king-crow. Sometimes this nightjar emits a squeak like that of the flying-fox. Blanford states that the eggs of this species are usually cream coloured, spotted and blotched with faint purple and pale brown. The only clutch that I discovered was of the hue of a crushed strawberry with dark strawberry and brown blotches.

Sind seems to be the headquarters of Sykes's nightjar (*C. mahratensis*) which is confined to the north and the west of India. It is very much like Franklin's species but there is more white in the tail, the outer feathers of which are almost entirely of this hue.

The Andaman islands have their own nightjar (*C. andamanicus*). This is a local race of Horsfield's nightjar, having black streaks all over the head and not on the crown only.

The jungle nightjar (*C. indicus*) occurs locally in the forests of India and Burma, being fairly common in the Nilgiris. According to Jerdon its call sounds like *tew-yo-yo*, and is frequently repeated. It can be identified, if held in the hand, by the fact that the four pairs of outer tail feathers have subterminal white bars in the male; in all other species only the two outer pairs are thus marked.

In Burma there is a nightjar that has ear tufts or aigrettes like those of some owls. This is known as the great-eared nightjar (*Lyncornis cerviniceps*). It is eighteen inches in length. I have no first-hand knowledge of it. It is said to roost in caves and to utter, both when perched and during flight, a "full, clear, trisyllabic whistle."

XI.—Frogmouths.

Frogmouths are nightjars that seem to be turning into parrots. The head of the frogmouth is not nearly so flat as that of the nightjar and the upper chap of the insignificant bill is hooked like that of a parrot. The cock and hen differ much in appearance. The nest is a small pad of soft material, wedged into the fork of a branch. Frogmouths are said to perch across a branch instead of along it as nightjars do. Apart from these peculiarities their habits are similar to those of nightjars. The cocks are grey, speckled and blotched with black; the plumage of the hens is of chestnut hue. The tail is wedge-shaped. There is no white wing-bar, but instead a white collar or necklace.

Blanford divides the frogmouths of India into three species:

Hodgson's frogmouth (*Batrachostomus hodgsoni*) found in Sikkim, Assam and Burma. Blyth's frogmouth (*B. affinis*) which is a denizen of the Malay Peninsula, but has been seen in Tenasserim, and the Ceylonese frogmouth (*B. moniliger*) which occurs in the forests of South India and Ceylon.

XII.—Trogon.

Although trogons are very different from nightjars and frogmouths there are some points of resemblance, and the trogons might perhaps be described as brightly-coloured diurnal nightjars. They are not sufficiently plentiful to merit a place among the common birds, but I will give a brief account of them here.

Trogons like nightjars, are widely distributed. They are scattered through the tropics of the new and the old worlds. Jerdon gives the following admirable general description of these beautiful birds: "The trogons are a remarkable family, of resplendent beauty, the most gorgeous of the species being from America; Africa and India each possessing a peculiar type. They vary in size from that of a thrush to a pigeon, and some of the American species have excessively long plumage over the tail, analogous to the train of a peacock. They lay their eggs in holes of trees, and live chiefly on insects which they capture in the air: some, however, perhaps all American trogons, are said to eat fruits. They manifest an affinity to the *Caprimulgidæ* in their thin, soft skin, downy plumage, feeble feet and other points. They resemble both the *Cuculidæ* and *Camprimulgidæ* in their anatomy, but, unlike them, their young are hatched naked. . . . Their brain is small. They have an exceedingly dense mass of plumage, very slightly implanted in the skin, and readily coming out, and the feathers possess a very large supplementary plume. In this they resemble the *Gallinaceæ*, as well as in the long train of some; the head too is small, and the neck very short." The three trogons found in India belong to the genus *Harpactes*. They are about a foot in length, the tail being longer than the head and body combined. The tail is square at the end in adults, graduated in young birds. The wings are short and rounded and the legs feathered for half their length. Trogons display a bare bluish patch of skin near the eye.

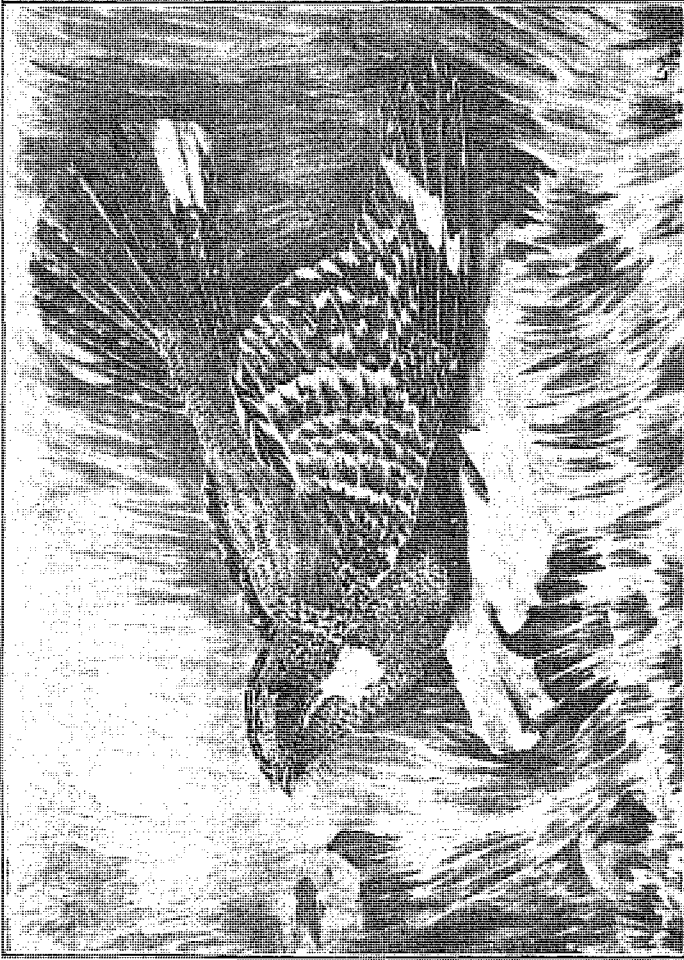
They are forest birds and secure their insect prey on the wing after the manner of flycatchers, or on the ground like the roller. Their calls are said to be soft and are sometimes like the mewing of a cat. They lay their creamy white eggs in hollows which they excavate in rotten parts of trees. Four species are described as occurring within Indian limits. One of these, the red-rumped trogon (*Harpactes dwvaucelli*) is really a bird of the Malay Peninsula, but has been seen in South Texas.

The yellow-breasted trogon (*H. orescius*) is confined to Lower Burma and the countries to the south.

The two Indian species are the Malabar trogon (*H. fasciatus*) the cock of which has a black head, and the red-headed trogon (*H. erythrocephalus*).



THE MALABAR TROGON (*HARPACTES FASCIATUS*), FEMALE.



THE MALABAR TROGON (*HARPACTES FASCIATUS*), MALE.

This latter occurs in the Eastern Himalayas, Assam and Burma. The cock is a study in red, black and white. His head and lower parts are crimson, very bright below. His upper parts are chestnut red, with some black and white in the wings and tail. The hen is crimson below and orange brown above.

The cock black-headed trogon differs from the red-headed form in the hue of the head. The hen may be distinguished from her red-headed sister by her yellowish brown abdomen.

This species occurs locally in the forests of Central and South India and of Ceylon.

INDEX

Adjutant, 50—52
Avocet, 31.

Barbets, 73—77
Bee-eaters, 81—86
Broadbills, 70—72
Bronze-Winged Jacana, 16—19

Coot, 1, 2
Coot, Purple, 20—22
Cormorants, 11, 12
Courier Plover, 29
Courser, Indian, 29
Cranes, 40—45
Curlew, 35—38
Curlew, King, 52, 53

Dabchick, 4, 5
Darter, 13
Demoiselle Crane, 40, 43, 45

Egrets, 57—60

Flamingoes, 46—48
Frogmouths, 121

Godwits, 38
Goggle-Eyed Plover, 29
Gulls, 9—11
Gull-Billed Tern, 7
Grebes, 3—5
Greenshanks, 34

Heron, 54—60
Herring-Gull, 10
Hoopoes, 116, 117
Hornbills, 108—116

Ibises, 52—56

Jacanas, 14—19

Kingfishers, 87—96

A

B

C

D

E

F

G

H

I

J

K

L

Lapwings, 25—28
Loriquet, 100, 101

M

Moorhen, 19, 20

N

Night Heron, 55—57
Nightjars, 117—121

O

Openbill, 50

P

Paddy-Bird, 56
Painted Stork, 50, 51
Paroquets, 96—100
Parrots, 96—100
Pelicans, 11
Piculet, 66
Plovers, 23—31
Pond Heron, 56
Pratincoles, 30, 31
Purple Coot, 20—22
Purple Heron, 56

R

Redshanks, 34
Rollers, 78—81

S

Sandpipers, 32—34
Sarus, 40—43
Scissorsbill, 8, 9
Skimmer, 8, 9
Snake-Bird, 13
Spinetails, 106
Spoonbill, 54
Stilt, 31, 32
Stone-Curlew, 25, 28, 29
Stone-Plover, 25, 28, 29
Storks, 49—51
Swallow-Plover, 30, 31
Swifts, 101—108
Swiftlet, 106, 107

T

Terns, 5—9
Thick-Knee, 29
Trogons, 122—125

W

Water-Plovers, 14—19
Water-Hen, 20—23
Whimbrel, 38
Whiskered Tern, 7
White Ibis, 52, 54, 56
Woodpeckers, 61—70

